

A review of the Acridinae s. str. (Orthoptera: Acridoidea: Acrididae) of eastern Africa with taxonomic changes and description of new taxa

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Abstract

The Acridinae of eastern Africa are reviewed and recognized as comprising 42 core genera, belonging to five different tribes, together with *Xerophlaeoba* and *Dorsthippus*, which are unclassified but appear to be related to some extra-limital genera. Keys are given to tribes and genus groups as well as to genera and, where necessary, species within each genus.

The following new taxa are described: *Anacteana* gen. n.: *A. hollisi* sp. n. and *A. neavei burtii* subsp. n.; *Brachybothrus* gen. n.: *B. phyllopterus* sp. n. and *B. hola* sp. n.; *Coryphosima stenoptera colorata* subsp. n.; *Duronina chloronota phippii* subsp. n.; *Oxyduronina* gen. n.: *O. anablepioides* sp. n.; *Sumba exilis* sp. n.

Nine new synonyms are recognized: *Sumba longicornis* Ramme, 1929 = *S. roseipennis* I. Bolívar, 1912, syn. n.; *Orthochirista variegata* Sjöstedt, 1931 = *Gymnbothrus linea alba* I. Bolívar, 1889, syn. n.; *Orthochirista elgonensis* Sjöstedt, 1931 = *Gymnbothrus linea alba* I. Bolívar, 1889, syn. n.; *Gymnbothrus gracilis* (Ramme, 1931) = *Gymnbothrus anchietae* I. Bolívar, 1889, syn. n.; *Gymnbothrus subcarinatus* (I. Bolívar, 1922) = *Gymnbothrus flexuosus* (Schulthess, 1898), syn. n.; *Gymnbothroides montanus* Kevan, 1950 = *Gymnbothrus levipes levipes* (Karsch, 1896), syn. n.; *Gymnbothroides keniensis* Johnston, 1937 = *Gymnbothrus levipes abbreviatus* (Chopard, 1921), syn. n.; *Gymnbothroides* Karny, 1915 = *Gymnbothrus* I. Bolívar, 1889, syn. n.; *Phloeochopardia* Dirsh, 1958 = *Gymnbothrus* I. Bolívar, 1889, syn. n.

The following 24 new or restored combinations, or new or restored states, are erected for previously described taxa: *Chokwea backlundii* res. comb. (formerly *Chromochokwea backlundii* (Uvarov, 1953)); *Chokwea eucteana* comb. n. (formerly *Platyverticula eucteana* Jago, 1983); *Sumba callosa* comb. n. (formerly *Rhabdoplea callosa* Uvarov, 1953); *Anacteana neavei* comb. n. (formerly *Acteana neavei* I. Bolívar, 1912); *Anacteana neavei neavei* stat. n.; *Duronina chloronota curta* Uvarov, 1953, stat. n. et comb. (formerly *Duronina curta* Uvarov, 1953); *Coryphosima abyssinica* (Uvarov, 1934), res. stat. (formerly synonymized with *C. elgonensis* by Dirsh, 1966 (though this was ignored by Otte 1995)); *Coryphosima amplificata* (Johnston, 1937), res. stat. et comb. n. (formerly *Rastafaria amplificata amplificata* (Johnston, 1937)); *Coryphosima morotoensis* (Jago, 1968), stat. n. et comb. n. (formerly *Rastafaria amplificata morotoensis* (Jago, 1968)); *Coryphosima triangularis* (Bouvy, 1982), comb. n. (formerly *Rastafaria triangularis* Bouvy, 1982); *Gymnbothrus longicornis longicornis* stat. n.; *Gymnbothrus longicornis ephippinotus* Jago, 1966, stat. n. et comb. n. (formerly *Gymnbothrus ephippinotus* Jago, 1966); *Gymnbothrus longicornis sellatus* Uvarov, 1953, stat. n.

et comb. n. (formerly *Gymnbothrus sellatus* Uvarov, 1953); *Gymnbothrus anchietae anchietae* stat. n.; *Gymnbothrus anchietae bounites* Jago, 1970, stat. n. et comb. n. (formerly *Gymnbothrus bounites* Jago, 1970); *Gymnbothrus anchietae flaviventris* Uvarov, 1953, stat. n. et comb. n. (formerly *Gymnbothrus flaviventris* Uvarov, 1953). *Gymnbothrus anchietae inflexus* Uvarov, 1934, stat. n. et comb. n. (formerly *Gymnbothrus inflexus* Uvarov, 1934); *Gymnbothrus levipes* (Karsch, 1896), comb. n.; *Gymnbothrus levipes levipes* (Karsch, 1896), stat. n. et comb. n. (formerly *Gymnbothroides levipes* (Karsch, 1896)); *Gymnbothrus levipes abbreviatus* (Chopard, 1921), stat. n. et comb. n. (formerly *Phloeochopardia abbreviata* (Chopard, 1921)); *Gymnbothrus pullus* (Karny, 1915), comb. n.; *Gymnbothrus pullus pullus* (Karny, 1915), stat. n. et comb. n. (formerly *Gymnbothroides pullus* Karny, 1915); *Gymnbothrus pullus minutus* (Ramme, 1929), stat. n. et comb. n., nom. res. (formerly *Gymnbothroides minutus* Ramme, 1929); *Gymnbothrus pullus hemipterus* (Miller, 1932), stat. n. et comb. n. (formerly *Gymnbothroides hemipterus* Miller, 1932).

Key words

bionomics, brachypterous, diagnostic features, genus groups, macropterous, micropterous, new genera, new species, tribes

Preface

The following article was written in 1995 and first accepted for publication, subject to an extensive revision, in 1997, at a time when the first author's health was beginning to deteriorate. Unfortunately, the manuscript's revision was delayed, and death prevented George Popov from seeing this major taxonomic paper into its final form. Corrections and numerous minor changes were subsequently made by his colleagues, Drs N.D. Jago and S.V. Green, then at the Natural Resources Institute (NRI), University of Greenwich, Chatham Maritime, Kent ME4 4TB, UK.

The NRI discontinued acridology in the late 1990s and its acridological staff dispersed. The revised Popov manuscript was consequently not resubmitted for publication but copies of it circulated among interested acridologists. The third author (Rowell) is engaged in editing the Handbook to the Grasshoppers of East Africa

(Rowell and Hemp 2015, 2017, 2018), a project that had originally inspired much of the NRI's acridological work but which had been halted by the death in 2005 of Dr. N.D. Jago, the prime mover. In preparing the treatment of the Acridinae for the Handbook, it became obvious that the incorporation of Popov's revisionary work needed its formal publication. Dr. A. Hochkirch and Mrs. Margaret Jago kindly supplied Rowell with annotated PDFs of the original manuscript and these have served as the basis of the present paper. Dr. L.D.C. Fishpool, who had worked extensively with Popov, undertook much proofreading and editorial activity. Minor updates have been made to Popov's original text, including the incorporation of a few recently described species and synonyms and of some new distributional records, especially of Sahelian species from northern Uganda; also, edits were made to fit the manuscript to the requirements of the current journal and to include the usage of current African geopolitical names (e.g. D.R. Congo for the former Zaire, and to acknowledge the emergence of South Sudan). However, all taxonomic decisions and treatment, the illustrations, the opinions expressed, and almost the entire text are solely the work of Popov. In a few places some editorial comment on taxonomic matters has, however, been necessary and is marked as such.

The new taxa erected in this paper are therefore to be understood as authored by Popov alone, as the other authors' contributions have been exclusively editorial and not acridological.

Since this text was originally drafted, the NRI's grasshopper collection has been transferred to the Natural History Museum, London (NHMUK). All material referred to in the text as originating from the NRI now forms part of that museum's entomological collection.

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Introduction

The subfamily Acridinae of the family Acrididae is a polyphyletic assemblage of taxa (Jago 1983a, b). It is closely similar to the subfamily Oedipodinae. The latter differs from the Acridinae in possessing a sound-producing mechanism of the femoral type consisting of a sharp ridge on the inner face of the hind femur and a corresponding serrated intercalary vein in the medial area of the tegmen (although there are some rare exceptions, such as *Sphingonotus* (*Parasphingonotus*) or *Sphingonotus* (*Neosphingonotus*), in which other tegminal veins are used)—a character absent in Acridinae. In some oedipodine taxa, however, this mechanism is only partially or weakly expressed and is thought incapable of sound production, so that there is no unanimity among acridologists on whether these two subfamilies should be kept separate or united.

This review is one of several taxonomic revisions required to provide the basis for a handbook and keys to the grasshoppers and locusts of eastern Africa, in preparation by the Natural Resources Institute, University of Greenwich, Chatham, U.K. (The handbook is currently appearing as Rowell and Hemp (Eds) (2015, 2017, 2018)). It is intended that, for this purpose, the two subfamilies

Acridinae and Oedipodinae will be treated as separate, in line with Uvarov (1966) and Otte (1981, 1984, 1995).

The following paper focuses upon the genera and species of Acridinae represented in eastern Africa, but in some cases taxa from other areas may be described in key form or given brief diagnostic definition in order to put the East African species into context.

Otte (1995), in his Orthoptera Species File (OSF), divided the subfamilies of the Acrididae into tribes. This had previously been standard only for the Pyrgomorphidae. Amongst the Acridinae, more than half of the species and genera listed in Otte's publication are classed as Tribe 'uncertain'. (Editorial comment: the OSF on-line (Cigliano et al. 2018) continues this tradition). In the present paper the taxa belonging to the Acridinae are newly grouped into tribes, which, where appropriate, are further divided into genus groups. The latter are intentionally chosen as units without formal nomenclatural status.

The principal characters used are as follows: external and internal genital structures of both sexes (primary importance); form and size; sculpturing of integument; structure of antennae, frons, and apex of head (including presence/absence of temporal foveolae); pronotal morphology; form of the organs of flight and sound-producing structures; shape of knee lobes of the hind femur, and, as appropriate, coloration.

The male epiphallus is particularly diagnostic and its structure is regarded as the principal character in the classification and grouping of the Acridinae (Jago 1983b). In females, however, the structure of the spermathecal duct provides characters for the separation of the two subfamilies. These facies have been little used hitherto. In the majority of Acridinae the duct is similar to that shown in Figs 1–3, having a characteristic 'proximal loop' (Slifer 1939), while the remainder of the duct is usually coiled in the form of a watch-spring positioned horizontally within the body cavity. In contrast, the duct of most Oedipodinae forms an untidy tangle, lacking the proximal loop, as seen (Fig. 4) in *Aiolopus thalassinus* (from Hollis 1968).

Previous authors have sometimes produced contentious solutions for the classification of certain acridine genera. Thus, Dirsh (1975) erected the Phlaeobinae as a separate subfamily within the Acrididae and the Pargainae as a subfamily within the Catantopidae. This was contested by Jago (1983b) who reduced both subfamilies to genus groups within the Acridinae.

1. Diagnosis of tribes and genus groups in the Acridinae and list of the sections of this paper

Tribe Truxalini

Type genus.—*Truxalis* Fabricius, 1775; priority for family-group names based on *Truxalis* dates from Truxalides Serville, 1838. First use as Truxalini by Thomas (1872). Until 1996, this taxon was often ranked as a separate subfamily (first use as Truxalinae by McNeill (1897)). Truxalines possess a stridulatory mechanism consisting of a serrated ridge on inner side of hind femur and sharp, raised radial and medial veins of tegmina. The strongly elongate body shape of the Truxalini is very similar to that of the *Acrida* genus group (tribe Acridini), and while the similarity of body form has been attributed to convergent evolution (Dirsh 1975), the striking fact that the genital structures of both sexes in the two groups are also remarkably similar cannot be explained as easily. Investigations by Jago (1996) confirmed that the two groups are in fact closely related, with the 'Truxalinae' representing a tribe of

the Acridinae. The former taxon was consequently reduced again to the rank of tribe (Truxalini) within this subfamily. Epiphallus illustrated in Figs 5–7.

Editorial note.—Included genera: since the downgrading of the Truxalinae, no formal listing of the genera included in the "new" Truxalini has been published. Dirsh (1975) listed 6 genera within the Truxalinae: *Truxalis* Fabricius, 1775, *Truxaloides* Dirsh, 1951, *Acridarachnea* I. Bolívar, 1908b, *Chromotruxalis* Dirsh, 1951, *Xenotruxalis* Dirsh, 1951, and *Oxytruxalis* Dirsh, 1951, and this grouping was accepted by Jago (1996). The OSF (Cigliano et al. 2018) currently lists only *Truxalis*; it is not clear on what authority the other genera have been dropped; some are currently given as *incerta sedis* within the Acridinae. Popov, however, in his original manuscript, listed only three genera: *Chromotruxalis*, *Truxalis*, and *Truxaloides*. He probably excluded the other three genera only because they do not occur in East Africa, the focus of his revisionary work.

Discussion.—No changes are proposed at the species and generic levels. This tribe is not considered further in this paper.

Tribe Acridini

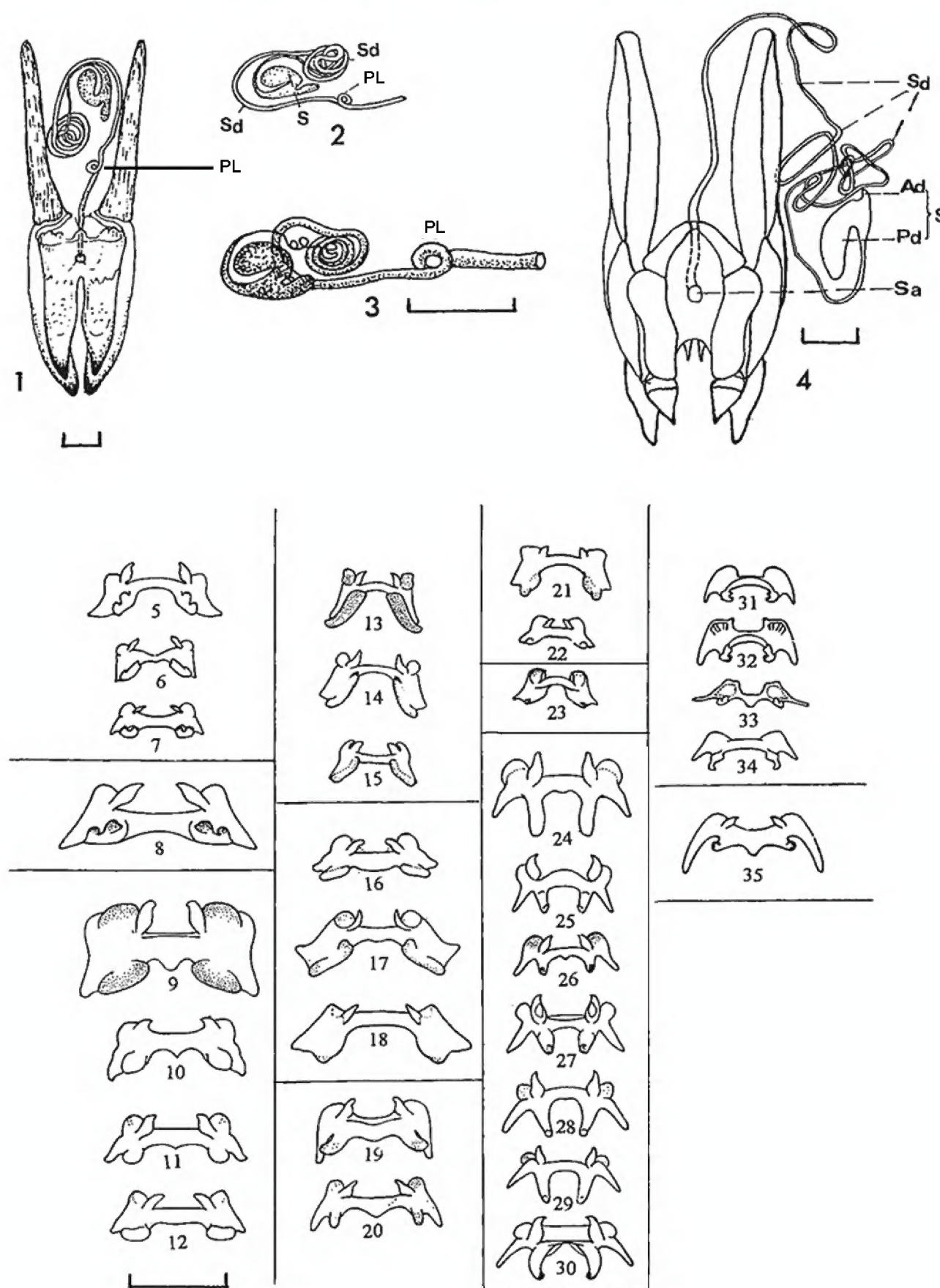
Type genus.—*Acrida* Linnaeus, 1758; priority for family-group names based on *Acrida* dates from Acridina MacLeay, 1821. First use as Acridini by Thomas (1872). The OSF (Cigliano et al. 2018) lists 10 genera in this tribe, most of which are Australian; only *Acrida* and *Acridarachnea* (the latter normally considered Truxaline) are African. In eastern Africa the tribe is represented only by the widespread genus *Acrida*. It shares its peculiar shape of body and head with the Truxalini, but differs in its mode of sound production, which consists of rubbing the hind wings against the tegmina in flight (crepitation), the wing having a wide, lustrous speculum in its medial area. This mechanism is not unique to *Acrida*, as it is also found in some other unrelated acridine genera and species, notably *Odontomelus scalata*. Epiphallus as in Fig. 8.

Discussion.—No changes are proposed at species or generic levels. This tribe is not considered further in this paper.

Tribe Phlaeobini and its genus groups

Type species.—*Gomphocerus rusticus* Stål, 1861 (= *Phlaeoba fumosa* Serville, 1838), by original monotypy. The first family-group name based on this genus is Phlaeobae Brunner von Wattenwyl, 1893. This group was also recognized by Johnston (1956). First use as Phlaeobini by Shumakov (1963). The taxon was briefly elevated to subfamily level (Phlaeobinae) by Dirsh (1975); Jago (1983b) subsequently reduced it back to a genus group within the Acridinae.

The tribe is defined by the following combination of characters: of small to medium size, body mostly elongate, cylindrical; antennae ensiform to narrowly ensiform, specialized or not; fastigium of vertex moderately elongate, its apex mostly parabolic-obtuse-angular, temporal foveolae weak or absent; pronotum mostly tectiform; tegmina and wings fully developed to strongly shortened, stridulatory mechanism not found; epiphallus bridge-shaped, bridge narrow, ancorae short, pointed, articulated with bridge, lophi monolobate, of variable width and depth, sometimes inflated, lateral plates moderately narrow with subacute or obtuse posterior projections (Figs 9–23); spermathecal duct with proximal loop and watch-spring medial coil of



Figs 1–35. **Figs 1–4.** Female spermathecal ducts. 1, 2. In *Orthochtha-Eupreoptera-Lobopoma* genus group (after Popov and Fishpool 1992): 1. Spermathecal duct in situ in relation to ovipositor valves; 2. Spermathecal duct isolated (s, sd, PL); 3. As Fig. 2, but in *Duronia* genus group. 4. Female genital ducts of the Oedipodinae, represented by *Aiolopus thalassinus thalassinus* (Fabr.) (after Hollis 1968). Abbreviations applying to Figs 1–4: PL – proximal loop of spermathecal duct, characteristic of most Acridinae, to contrast with its absence in Fig. 4, which is characteristic of Oedipodinae; Sd – spermathecal duct; Sa – spermathecal aperture; S – spermatheca; Ad, Pd – apical and preapical diverticula of spermatheca. **Figs 5–39.** Male epiphalli representing tribes and genus-groups of the Acridinae s. str. (after Dirsh 1956). **Figs 5–7.** Tribe Truxalini: 5. *Truxalis nasutus* (L., 1758); 6. *Chromotruxis cockerelli* (Uvarov, 1932); 7. *Truxaloides serratus* (Thunberg, 1815). **Fig. 8.** Tribe Acridini: *Acrida turrita* (L., 1758). **Figs 9–23.** Tribe Phlaeobini: **Figs 9–12.** *Orthochtha-Eupreoptera-Lobopoma* genus group: 9. *O. venosa* (Ramme, 1929); 10. *O. g. dasyncnemis* (Gerstaecker, 1869); 11. *Eupreoptera polychroma* Uvarov, 1953; 12. *Lobopoma ambages* Karsch, 1896. **Figs 13–15.** *Cannula-Glyphoclonus-Culmulus* genus group: 13. *Cannula linearis* (Saussure, 1861); 14. *Glyphoclonus miripennis* Karsch, 1896; 15. *Culmulus stramineus* Uvarov, 1953. **Figs 16–18.** *Afrophlaeoba* genus group: 16. *Paralobopoma gracilis* (Ramme, 1929); 17. *Afrophlaeoba usambarica* (Ramme, 1929); 18. *Chokwea burri* Uvarov, 1953. **Figs 19, 20.** *Duronia* genus group: 19. *Duronia chloronota* (Stål, 1876); 20. *Duroniella laticornis* (Krauss, 1909). **Figs 21, 22.** *Sumba-Rhabdoplea-Panzia* genus group: 21. *Rhabdoplea munda* Karsch, 1893; 22. *Sumba roseipennis* I. Bolívar, 1912. **Fig. 23.** *Ocnocerus-Anacteana* genus group: 23. *Ocnocerus diabolicus* Karsch, 1893. **Figs 24–30.** Tribe Gymnbothrini: 24. *Zacompsa festa* Karsch, 1893; 25. *Coryphosima stenoptera* (Schaum, 1853); 26. *Chirista compta* (Walker, 1870); 27. *Comacris semicarinatus* (Gerstaecker, 1869); 28. *Gymnbothrus pullus* (Karny, 1915); 29. *Gymnbothrus lineaalba* I. Bolívar, 1889; 30. *Malcolmburria angolensis* Uvarov, 1953. **Figs 31–34.** Tribe Pargaini: 31. *Acteana alazonica* Karsch, 1896; 32. *Odontomelus scalatus* (Karsch, 1896); 33. *Machaeridia bilineata* Stål, 1873; 34. *Parga cyanoptera* Uvarov, 1926. **Fig. 35.** Unclassified genera: 35. *Xerophlaeoba deserticola* (Krauss). All scale-lines represent 1 mm: that under Fig. 1 applies to Figs 1 and 2; that under Fig. 3 applies to Fig. 3; that under Fig. 4 applies to Fig. 4; that under Fig. 12 applies to Figs 5–39.

variable length, occasionally with supplementary reservoir, spermatheca unspecialized.

This is the largest and the most widespread tribe of Acridinae, and can be readily subdivided into several distinct genus groups as follows:

Orthochtha-Euprepoptera-Lobopoma genus group

Of medium size, slender, integument smooth. Antenna ensiform. Pronotum weakly tectiform to weakly sellate. Mostly fully winged, but some *Lobopoma* species micropterous. Epiphallus (Figs 9–12) with elongate ancorae; lophi wide, of varying depth. Female seminal duct of varying length and number of coils, sometimes (in *O. nigricornis* species group) with a supplementary seminal vesicle (Popov and Fishpool 1992: fig. 15).

Discussion.—No changes are proposed following the revision of all three genera in the genus group by Popov and Fishpool (1992). This genus group is not further considered in this paper.

Cannula-Glyphoclonus-Culmulus genus group

Differing from the *Orthochtha-Euprepoptera-Lobopoma* genus group in the following respects: body elongate, very slender, sometimes straw-like. Antennae long, broadly ensiform. External upper knee-lobe more or less elongate. Wings full length or somewhat abridged. Epiphallus as in Figs 13–15. Included East African genera are *Cannula*, *Glyphoclonus*, and *Culmulus*; extralimital genera include *Cohembia* Uvarov, 1953, *Oxyolena* Karsch, 1893, *Gelastorhinus* Brunner, 1893, and *Gonista* I. Bolívar, 1898.

Discussion.—Taxonomic changes and redefinition of genera and species are given below, where necessary.

Afrophaeoba genus group

Closely related micropterous phlaeobine genera, mostly of restricted East African distribution. Included genera: *Afrophaeoba*, *Brachyphaeobella*, *Chokwea*, *Chromochokwea*, *Paralobopoma*, *Parodontomelus*, *Platyverticula*, and the Madagascan *Chlorophlaeobella* Jago, 1983. Below medium size, of medium to robust build and of predominantly cryptic coloration but occasionally (some *Chokwea*, *Chromochokwea*, and *Paralobopoma*) brightly colored. Similar in their general appearance to genus *Odontomelus* (Pargaini) but with female genital structures as in Fig. 3, except in *Platyverticula* which has a strongly retracted ovipositor. Epiphallus as in Figs 16–18.

Discussion.—Taxonomic changes to the genera *Chokwea* and *Platyverticula* are given later in this paper, coupled with redescription and redefinition of taxa where necessary.

Ocnocerus genus group

This is divided into two related sub-groups:

(i) *Sumba-Rhabdoplea-Panzia* genus sub-group. Small, slender, mostly graminicolous taxa; integument rugose, callose, sometimes longitudinally ridged. Antennae ensiform to narrowly ensiform. Fully winged to micropterous. Epiphallus with short, round, somewhat globular lophi (Fig. 21, *Rhabdoplea munda* Karsch, 1893; Fig. 22, *Sumba roseipennis* I. Bolívar, 1912) which form broad lobate structures, and posterior lateral lobes of epiphallus which are produced into short, rounded or obtuse-angulate processes.

Discussion.—Taxonomic changes to the genera are given later in this paper, coupled with redescription and redefinition of taxa where necessary.

(ii) *Ocnocerus-Hyperocnecerus-Anacteana* (gen. n.) genus sub-group. Closely related to preceding, differing principally in having more terricolous habits. Size small, robust, integument coriaceous, sometimes ridged. Antennae specialized into basal, medial, and apical parts. Micropterous. Epiphallus as in Fig. 23.

Discussion.—This sub-group has undergone considerable internal rearrangement and descriptions of new taxa have been necessary for this paper.

Duronia genus group

Included genera: *Duronia*, *Duroniella*, *Leopardia*, *Oxyduronia* (gen. n.).

In build, similar to *Orthochtha-Euprepoptera-Lobopoma* genus group, but all taxa fully winged. Differ primarily in genital structures, with epiphallic lophi intermediate in their shape between digitiform and lobiform, forming elongate, narrow, flattened lobes; posterior processes are elongate and pointed (Figs 19, 20). The genital structures in females are similarly distinctive. In particular, the spermathecal duct in its proximal half is relatively thick, of a large diameter; beyond the middle fold, the distal half is very thin, in the nature of a fine capillary (Fig. 98E). The females in this respect are transitional between Phlaeobini and Gymnobothrini, but closer to the former. This tribe is thus intermediate between two large generic clusters: the *Sumba-Rhabdoplea-Panzia* genus sub-group of the Tribe Phlaeobini and the Tribe Gymnobothrini.

Discussion.—Some redefinition of genera has been made and keys are provided to assist in identification to species level.

Tribe Gymnobothrini

Type genus.—*Gymnobothrus* I. Bolívar, 1889. Johnston (1968) recognized a group Gymnobothri. This large and distinctive tribe was designated by Dirsh (1975) as subfamily Gymnobothrinae, but this usage has not found favor. It contains 11 East African genera and several others from elsewhere. Most taxa are of similar appearance, of small to medium size, and medium sub-cylindrical build. Most are fully winged, but some are brachypterous or micropterous. Antennae narrowly ensiform to filiform. Temporal foveolae usually present, but often weak. Male genitalia provide the principal diagnostic features of the group, though not of the individual genera; epiphallus with narrow bridge, ancorae strong, long, with acute apices; lophi long, finger-shaped, almost perpendicular to the bridge, with hooked apices; lateral plates narrow, elongate, with sub-acute, slender, elongate posterior projections (Figs 24–30). Ancorae are large and articulate, which separates them from the Pargaini in which they are vestigial or absent.

Included East African genera: *Chirista*, *Comacris*, *Coryphosima*, *Roduniella*, *Gymnobothrus* (incorporating *Gymnobothroides* and *Phloeochopardia* as n. syns.), *Brachybothrus* (gen. n.) *Guichardippus*, *Malcolmburria*, *Rastafaria*, *Tenuihippus*, and *Zacompsa*.

Discussion.—Considerable revision within this tribe has required an extensive taxonomic treatment, which is presented below.

Tribe Pargaini

Type genus.—*Parga* Walker, 1870. Dirsh (1975) erected a subfamily Parginae within his family Catantopidae, including 7 genera. This action was contested by Jago (1994), who returned them to the Acridinae.

Included genera: *Parga*, *Phryganomelus*, *Acteana*, *Machaeridia*, *Odontomelus* (including its synonyms (Jago 1994) *Amphicremna*, *Parga*, *Pargaella*).

This is another distinctive tribe. With the exception of *Acteana*, which is terri-graminicole and externally similar to the *Ocnocerus-Hyperocnecerus-Anacteana* (gen. n.) genus sub-group, its taxa are graminicoles of small to medium size, elongate, slender build with, in some cases, an integument which is longitudinally ridged and striated. Broadly ensiform antennae. Knee lobes are elongate. Organs of flight of variable shape and length. The epiphallus is the principal diagnostic feature of the group: bridge relatively narrow; ancorae absent or vestigial; lophi short, usually bilobate, narrowly rounded apically; lateral plates well developed (Figs 31–34).

Discussion.—The distinction between this tribe and the Phlaeobini is detailed below (p. 44, Table 2).

Unclassified genera

Only one East African acridine genus, *Xerophlaeoba*, cannot be assigned to the tribes listed above and so is placed in this cluster, but there are several others outside Africa and the group needs further study. Externally, *Xerophlaeoba* is very similar to the *Orthochtha-Euprepoptera-Lobopoma* genus group, but its genital structures (Fig. 35) are unlike those of any other group, and its systematic position is therefore ambiguous. (Otte (1995) listed it under Phlaeobini.)

Transitional genera

Editorial note.—Popov included in this group the genera *Paracinema*, *Jasomenia*, *Aiolopus*, *Uganda*, and *Dorsthippus*; epiphalli shown in Figs 36–39. He wrote “In some respects these genera bridge the gap between Acridinae and Oedipodinae. They are predominantly graminicoles” (as are most acridines) “and similar in general appearance to members of the *Duronia* genus group and the Gymnobothrini. The first three genera are alate with well-developed and, to some extent, serrated intercalary veins in the medial field of tegmina, but are said to be incapable of sound production. *Uganda* is a brachypterous/micropterous genus that could be related to *Paracinema*. The female genital structures are typically oedipodine rather than acridine”. In the present editors’ opinion, these genera are more usefully classified as oedipodines, as indeed they (other than *Uganda*) already are in the OSF (Cigliano et al. 2018). All morphological characters align them with this subfamily, and the alleged inability to stridulate is a negative character, logically difficult to substantiate, and possibly behaviorally determined. We have therefore omitted these “Transitional Genera” from the remaining text of this paper. Popov proposed no taxonomic changes within any of them.

Popov further wrote “*Dorsthippus* is an aberrant genus, apparently without close relation to other Acridinae. In general appearance it is reminiscent of some Palaearctic Gomphocerinae, but the absence of a stridulatory file on the inner face of hind femur and its genital structures suggest rather an affinity with the Acridinae”. Logically, *Dorsthippus* could equally well be included in group 6, the “Unclassified Genera”.

2. Detailed treatment of selected tribes and genus groups

2.1. The tribe Phlaeobini and its genus groups

Genus group diagnosis

The *Cannula-Glyphoclonus-Cumululus* genus group

Description.—Elongate, slender build and broadly ensiform antennae; sometimes extended genicular lobes (outer genicular lobes longer than inner, unlike Pargaini). Epiphallus with its large articulated ancorae and broad lobiform lophi (Figs 13–15), clearly indicates that this genus group is part of Tribe Phlaeobini and close to *Orthochtha* (Figs 9–12).

Discussion.—Strongly graminicolous habitat has led to convergent evolution in their morphology with the similarly adapted members of the Tribe Pargaini. Only the three genera with known East African distributions are included here, while others, some of them common elsewhere, such as *Cohembia* Uvarov, 1953 (Angola), *Oxyolena* Karsch, 1893 (a rare endemic from Togo), *Gelastorhinus* Brunner, 1893, and *Gonista* I. Bolívar, 1898 (disjunct distribution in western Africa and southern Asia), are omitted. *Gonista*, represented in D.R. Congo and Zambia by *G. longicercata* Bouvy, 1982, may eventually be collected in adjacent parts of Tanzania, and is therefore included in the key below.

Key to genera in the genus group *Cannula-Glyphoclonus-Cumululus*

- 1 Upper outer lobe of hind knee enlarged more than the inner 2
- Knee lobes not enlarged 3
- 2 Mesosternal interspace closed. Head more than twice as long as pronotum. Body extremely elongate, straw-like *Cannula* I. Bolívar, 1906
- Mesosternal interspace open. Head not more than half as long again as pronotum. Body slender, elongate, but not straw-like *Glyphoclonus* Karsch, 1896
- 3 Frontal ridge above antennal sockets lamelliformly compressed forming single carinula (Fig. 41). Apex of male abdomen as in Fig. 44 *Cumululus* Uvarov, 1953
- Frontal ridge narrow, but not lamelliform, forming single carinula. Apex of male abdomen as in Figs 45, 46 *Gonista* I. Bolívar, 1898

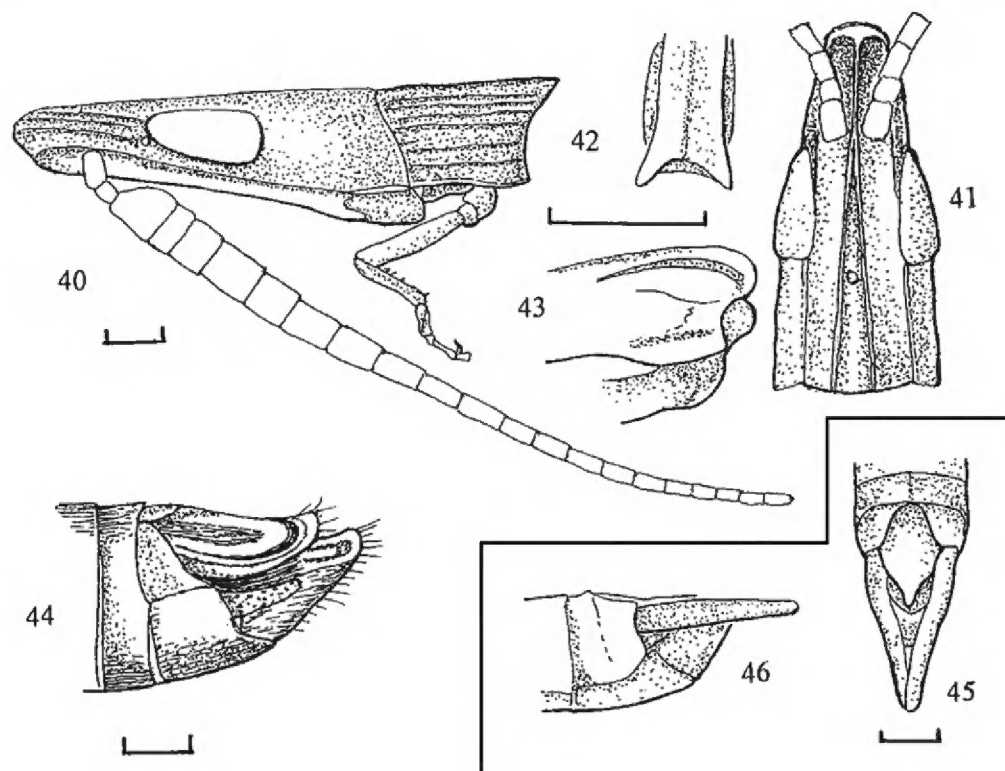
Generic diagnosis

Cannula I. Bolívar, 1906

Cannula I. Bolívar, 1906: 394. Nom. nov. for *Calamus* Saussure, 1861.

Type species.—*Calamus linearis* Saussure, 1861 by original designation.

Description.—As in key to genera. Size variable from medium to large, sexual dimorphism marked. Body very elongate, slender, straw-like. Antenna ensiform, strongly compressed, shorter than head and pronotum together. Head very elongate, narrow, conical. Fastigium of vertex more than twice length of basal part of head, with parabolic apex. Frontal ridge in upper half strongly, lamelliformly compressed, gradually widening in lower half. Pronotum short with well-developed medial carina and straight, parallel, lateral carinae with strong longitudinal ridges between them. Two sulci crossing dorsum; metazona shorter than prozona with roundly



Figs 40–46. *Cannula-Glyphoclonus-Cumulus* genus group. **Figs 40–44.** Male *Culmulus stramineus* Uvarov, 1953. **40.** Lateral aspect head and pronotum from left side; **41.** Anatomy of frons and frontal ridge; **42.** Left posterior femoral apex from above; **43.** Same as 42, from the side; **44.** Abdominal apex, oblique view from left side. **Figs 45, 46.** Male *Gonista longicercata* (Bouvy, 1982): **45.** Abdominal apex from above; **46.** Abdominal apex from left side.

excurred posterior margin. Mesosternal interspace closed. Tegmina well developed with dense venation and reticulation; wings shorter, sometimes much shorter. Hind femur very narrow, not reaching end of abdomen; external upper lobe of hind knee strongly elongate; lower lobes moderately elongate, of equal length. Male supra-anal and subgenital plates elongate, acutely angular; cerci short, conical. Epiphallus with narrow bridge, moderately large ancorae and very large lobiform lophi (Fig. 13). Ovipositor unspecialized.

Discussion.—The systematics of this genus are in a confused state. Numerous species have been described, but the majority was subsequently synonymized under the senior synonym *Cannula gracilis* (Burmeister, 1838). Roy (2003) described a new West African species from Mt. Nimba (*Cannula vestigialis* Roy, 2003). The only species recorded in East Africa is *Cannula gracilis*. This differs from the other common species, *C. karschi* (Kirby, 1910), not to date recorded in East Africa, in its slenderer build and in having shortened hind-wings.

Species notes

Cannula gracilis (Burmeister, 1838)

Fig. 13

Mesops gracilis Burmeister, 1838: 610.

Calamus linearis Saussure, 1861 (Dirsh 1966)

Full synonymy given in Dirsh (1970: 415, 416).

Material.—Holotype female: SOUTH AFRICA, Cape of Good Hope (MfN). Also: ETHIOPIA: L. Haradaka; L. Zwai; Mulu, above Mugor valley; nr. Adama, Bakuru Bridge, Didessa R. rd. UGANDA: Entebbe; Kawanda; Adachal; Kapeka; Bugwere; Mubende; Tororo; Teso; West Nile; Adjumani; Acholi; Karamoja. TANZANIA: Lotanguru; Tukuyu; Tabora; Old Shinyanga; Morogoro; Itymbya, 30 mi. W. Kahama; Ushirombo rd. 22 mi. W. Kahama; Mkwemi; Lake Rukwa. KENYA: Thika; Thiala hills; Lake Rudolf; Nairobi.

Description.—As for the genus. Whole insect figured in Dirsh (1965): 413, fig. 328. Coloration variable, mostly in shades of stramineous and light brown, but also greyish, with fire-melanic forms common. Black spot on hind wing appears and intensifies with maturation.

Distribution.—Widespread in Africa south of the Sahara.

Biology.—A strict graminicole, largely confined to savanna grasslands.

Editorial note.—Popov's original manuscript did not treat *Glyphoclonus* further, but it seems appropriate to include a brief description here:

Generic diagnosis

Glyphoclonus Karsch, 1896

Glyphoclonus Karsch 1896: 249.

Type species.—*Glyphoclonus miripennis* Karsch, 1896, by original monotypy.

Type locality.—MALAWI, Milanji.

Description.—(From Dirsh 1965). Of medium size, with very elongate body. Integument strongly carinate. Antenna ensiform, strongly compressed, slightly shorter than head and pronotum together. Head elongate, acutely conical, strongly carinate above; fastigium of vertex longer than longest diameter of eye, with broadly parabolic apex; fastigial foveolae absent; frons straight, frontal ridge in upper half strongly compressed, plate-like, in lower half slightly widening, sulcate in whole length, with high lateral carinulae. Eyes small, slightly flattened. Prosternum without process. Mesosternal interspace open, strongly constricted in middle. Elytra and wing fully developed; elytra narrow, with dense, rough venation; intercalary vein of medial area present. Wings brightly colored. Hind femur moderately narrow; external apical lobe of hind knee enlarged, slightly projecting downwards, inner one not specialized; external lower lobe slightly elongate-angular, shorter than upper; inner one of normal shape. Arolium large. Male supra-anal plate elongate-angular. Cercus slightly compressed, with obtuse apex. Subgenital plate elongate, acutely conical. Epiphallus (Fig. 14) with narrow bridge, moderately large ancorae and large, lobiform lophi. Ovipositor short, robust, with slightly curved valves; lower valve with relatively large external lateral projection.

Discussion.—The genus is monotypic, with only one known species. No changes in status are recommended.

Species notes

Glyphoclonus miripennis Karsch, 1896

Fig. 14

Glyphoclonus miripennis Karsch 1896: 250.

Description.—The generic description applies. Bases of hind wings in mature adult dark red, yellow, or orange. Abdominal tergites banded in dark blue.

Distribution.—Found principally in the African Sahel region, from SENEGAL to CHAD, but also occurs in D.R. CONGO, MALAWI, and UGANDA: Adjumani and W. Busoga.

Biology.—Fishpool and Popov (1984) record the species in MALI as being gramnivorous and mesophilous. In Uganda it occurs in dry grass savanna.

Generic diagnosis

Culmulus Uvarov, 1953

Culmulus Uvarov, 1953: 163.

Type species.—*Culmulus stramineus* Uvarov, 1953, by original designation.

Description.—As in key to genera. Small, body elongate, slender, straw-like. Integument ridged. Antenna ensiform, broad at base, as long as, or longer than, head and pronotum. Head elongate, narrowly pointed. Fastigium longer than longest diameter of eye, with parabolic vertex and medial carinula. Foveolae absent. Frontal ridge with margins lamelliformly compressed above antennal sockets, divergent below. Pronotum short, narrow with sharp parallel carinae. Dorsum crossed by two sulci. Metazona shorter than prozona, its hind margin obtuse-angular. Mesosternal interspace strongly constricted, open. Tegmina and wings fully developed, acutely pointed apically; venation and reticulation dense. Hind femur narrow, slender, not reaching tip of abdomen. Lobes of hind knee of equal length. Apex of male abdomen (Fig. 44). Epiphallus (Fig. 15).

Measurements.—See Table 1.

Discussion.—The genus contains two described species: *stramineus* Uvarov, 1953 and *crassior* Uvarov, 1953, both described from Angola, but only the former reaches eastern Africa.

Species notes

Culmulus stramineus Uvarov, 1953

Figs 15, 40–44

Culmulus stramineus Uvarov, 1953: 164, figs 213–220.

Material.—Holotype male: ANGOLA: Moxico distr., Villa Luso (NHMUK).

Description.—As for the genus. General coloration light stramineous, somewhat darker dorsally; hind wing with base black.

Discussion.—Superficially this species is very similar to *Parga* spp., but differs in the following respects: antennae of simple unmodified ensiform structure, longer than head and pronotum; integument not as deeply ridged as in *Parga*; frontal ridge lamelliformly compressed in its upper third; lobes of hind knee are not enlarged; male epiphallic structures are as in Fig. 15, quite distinct from those in *Parga* (Fig. 34).

Measurements.—See Table 1.

Distribution.—ANGOLA, TANZANIA: S. of Uvinza, ZAMBIA: Mweru wa Ntipa. Adults VII–IX.

Table 1. Body dimensions of *Culmulus stramineus*.

	M (mm)	F (mm)
Pronotal length	3.5	4
Tegminal length	16	19
Hind femur length	9	10
Length of body	21.0–22.5	24.2–26.0

Genus group diagnosis

The *Afrophlaeoba* genus group

Description.—The differential diagnosis between the flightless Phlaeobini (the *Afrophlaeoba* genus group) and the morphologically convergent Pargaini is given in tabular form, using *Odontomelus kwidschwianus* (Pargaini) (Figs 47–51) and *Paralobopoma viridifrons* (Phlaeobini) (Figs 52–56) to represent the two taxonomic clusters (Table 2). Note that in the Phlaeobini, the apical valves of penis, albeit covered by a membrane, often protrude through the opening even in repose.

Discussion.—The flightless members of tribe Phlaeobini include eight genera; seven from eastern Africa (see p. 41) and one from Madagascar (*Chlorophlaeobella* Jago, 1983). They show remarkable convergent evolution with flightless groups of the Pargaini, particularly *Odontomelus* I. Bolívar and its allies. The taxonomic confusion that this caused was studied by Jago (1983b, 1994).

Table 2. Differentiation between Phlaeobini and Pargaini.

	Pargaini	Phlaeobini
Temporal foveolae	small but distinct	absent
Raised longitudinal ridge dorsally on anterior and mid-femora	present (Fig. 48)	absent (Fig. 53)
Lower lobes of hind knee	acute (Fig. 49)	rounded (Fig. 54)
Male sub-genital plate	elongate, acutely pointed (Fig. 50)	blunt, spoon-shaped (Fig. 55)
Epiphallus	(Fig. 51)	(Fig. 56)

Key to genera in the flightless *Afrophlaeoba* genus group

The genus group is predominantly East African. Only the East African taxa are considered here:

- 1
- Fastigium of vertex nearly as wide as long; arcuate transverse sulcus of fastigium submarginal; as seen from above, interocular space nearly as wide as compound eye.2
-
- Fastigium of vertex longer than wide; transverse arcuate sulcus of fastigium roughly in mid position, in line with front edge of compound eyes3
- 2
- Lateral pronotal carinae straight in male, weakly outflexed in female; width of prozona nearly equal to its length. Tegmina less than half as wide as long. Size small; male under 15 mm long. Integument very smooth and shiny. S.W. TANZANIA (Ufipa).....*Chromochokwea* Jago, 1983
-
- Lateral pronotal carinae straight to more or less inflexed in prozona, divergent posteriorly in metazona; prozona distinctly longer than wide. Width of tegmen more than half its length. Size larger; male over 15 mm long. Integument less shiny, often pilose. S.W. TANZANIA, N. MALAWI, N. ZAMBIA, S.E. D.R. CONGO, ANGOLA, BOTSWANA.....*Chokwea* Uvarov, 1953

- 3 Very small dark species; length of female about 20 mm (male not known). Vertex, occiput, pronotal disc and thorax wrinkled and rugose. Lateral pronotal carinae straight and weakly divergent backwards; length of prozona less than 15 times its greatest width. A rare endemic (male unknown). S.W. UGANDA..... *Brachyphlaeobella* Jago, 1983
- Not with above combination of characters.....4
- 4 Lateral pronotal carinae regularly and strongly incurved in prozona and flared outwards in metazona. Supra-anal plate in male nearly as wide as long; in female abdominal apex specialized, ovipositor valves truncated and retractile, cercus minute. N. SOMALIA.....
..... *Platyverticula* Jago, 1983
- Lateral pronotal carinae not, or only gently, incurved; male supra-anal plate longer than wide; apex of abdomen of female not modified.....5
- 5 Lateral pronotal carinae straight or gently bowed inwards in male and outwards in female. Disc of pronotum 3x longer than wide with, in male, prozona more than twice as long as wide. Medial dorsal carinula of vertex strong. In male, tips of cerci level with tip of supra-anal plate and sub-genital plate projecting only a little further. Coloration of both sexes in dull shades of brown and greyish. E. TANZANIA.....
..... *Afrophlaeoba* Jago, 1983
- Lateral pronotal carinae weak but entire and straight, diverging towards the rear. Pronotal prozona as long as wide. Medial dorsal carinula of vertex weak or absent. Apices of cerci extending beyond tip of supra-anal plate; subgenital plate projecting strongly beyond tip of supra-anal plate. Males brightly colored.....6
- 6 Transverse arcuate groove of vertex weak; fastigium in front of it rugose with at least traces of medial carinula. In male, fastigium half width of pronotal prozona. Colorful species; medial dorsal band on head, thorax and abdomen maroon or green; in females, legs with some green pigmentation. UGANDA, D.R. CONGO, RWANDA.....
..... *Paralobopoma* Rehn, 1914
- Transverse arcuate groove of vertex level with compound eyes (Figs 62, 63). Fastigium of vertex concave, narrow. In males, length of pronotal prozona more than twice its narrowest width. Both sexes in shades of brown and black. Tegmina brown, or light and dark brown, never brightly colored. E. TANZANIA: Zanzibar. SOMALIA ..
..... *Parodontomelus* Ramme, 1929

Generic diagnosis

Brachyphlaeobella Jago, 1983

Brachyphlaeobella Jago, 1983b: 122.

Type species.—*Brachyphlaeobella achilles* Jago, 1983b, by original designation.

Description.—As in key to genera (pp. 44, 45). Known only from the female types. Superficially most like *Afrophlaeoba* Jago but smaller. Antennae short and robust, weakly dilated basally. Fastigium of vertex about as wide as long; medial carinula weak, interrupted by transverse arcuate sulcus positioned slightly ahead of edge of compound eyes. Frontal ridge with lateral margins rounded and gradually fading below level of antennal sockets (sharp and entire down to clypeal suture in *Afrophlaeoba*). Pronotal prozona about 1.5x as long as greatest width of pronotal disc (proportionately longer in *Afrophlaeoba*). Lateral carinae weakly excurved; rear margin of metazona medially emarginate. Tegmina strap-like,

slender and small, 6x longer than wide, barely extending half-way across first abdominal tergite. Tympanic membrane reduced, less than half width of first tergite and not covered by tegmen. Genital structures and hind knee-lobes unspecialized.

Discussion.—The genus is rare and, being small, is easily overlooked and could be mistaken for nymphs of other genera such as *Paralobopoma* and *Odontomelus*.

Species notes

Brachyphlaeobella achilles Jago, 1983

Brachyphlaeobella achilles Jago, 1983b: 124, fig. 64.

Material.—Holotype female and paratype female: UGANDA: Kigezi, Impenetrable Forest Res. 29°42'E, 01°00'S; Kigezi, 13 miles Kabale-Kisoro rd.; IX. (NHMUK).

Description.—Females. As for the genus. Vertex, occiput, pronotal disc and thorax wrinkled and rugose. Coloration light to dull brown, with lighter brown lateral carinae. One specimen with dark brown sides and a pale ochre dorsal stripe.

Distribution.—S.W. UGANDA.

Generic diagnosis

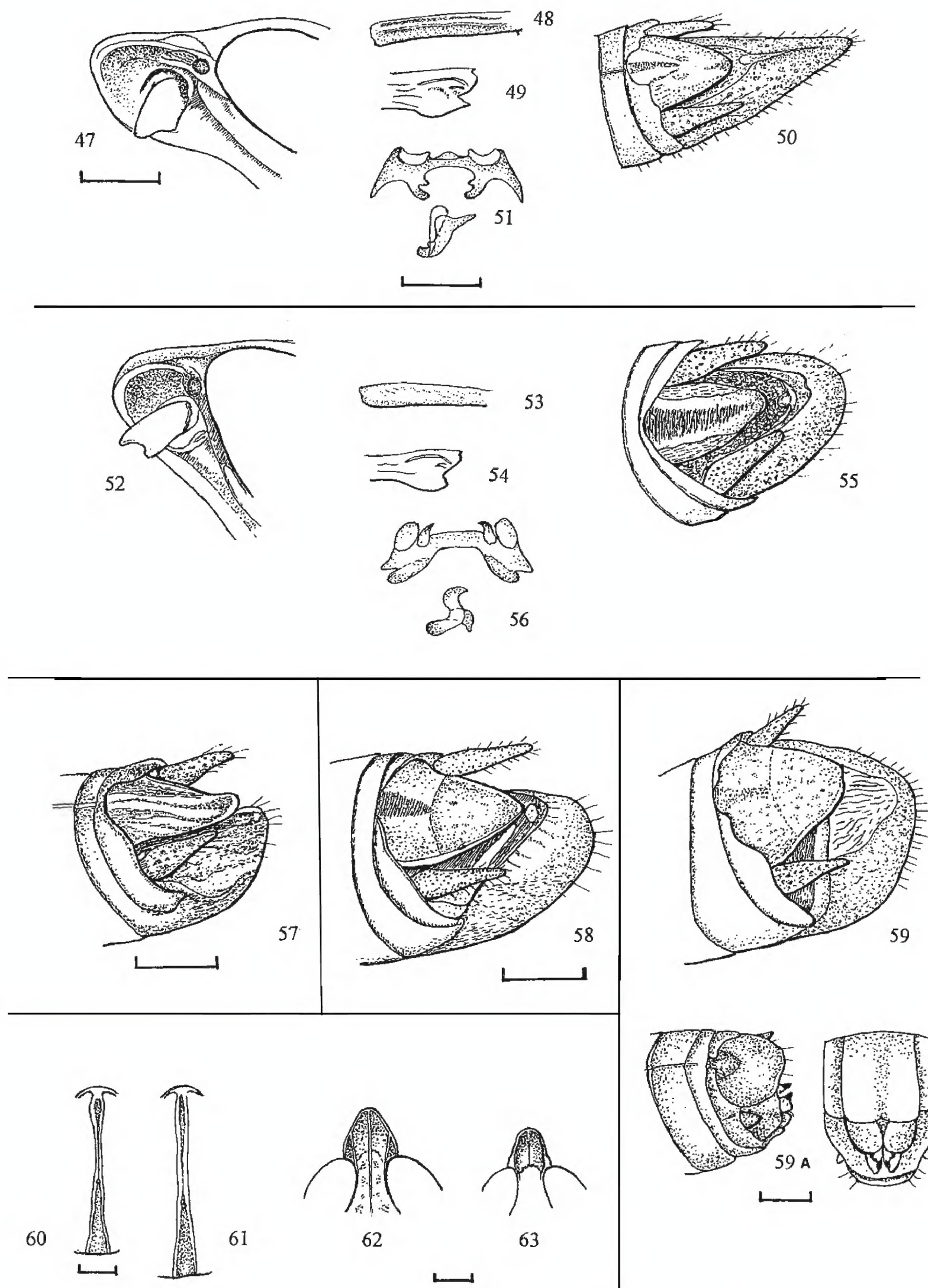
Platyverticula Jago, 1983

Platyverticula Jago, 1983: 116–121.

Type species.—*Platyverticula ritchiei* Jago, 1983b, by original designation.

Description.—As in the key to genera (pp. 44, 45). Of medium size, rather robust, superficially similar to *Chokwea*. Antennae thick, in male about 1.5x length of head and pronotum, in female slightly shorter; basal 3–4 segments of flagellum weakly flattened and broadened. Head acute in profile with frontal ridge straight, its margins wavy and irregular, constricted above ocellus, markedly divergent below it, but not constricted at junction with fastigium. Fastigium of vertex longer than broad in male, as broad as long in female. Arcuate transverse sulcus in forward position, but markedly less so than in *Chokwea* spp. Pronotal prozona lightly inflated in profile; posterior transverse sulcus forwardly arched, more so in female. Lateral carinae regularly incurved in prozona, flared outwards in metazona; hind margin of latter obtusely angularly emarginate. Tegmina symmetrically ovoid, their apices roughly level with hind margin of first abdominal tergite. Tympanum moderately developed, barely covered by tegmina. Hind femora moderately heavy, stockier than those of *Chokwea*; lobes of hind knee rounded. External and internal genital structures in male of characteristic shape (Fig. 59). In female, genital structures are even more characteristic (Fig. 59A), especially in the truncated retractile ovipositor valves and tiny triangular vestigial cerci.

Discussion.—A remarkable monotypic genus known only from Somalia. The specialized genital structures, particularly of the female, are unlike those of any other genus in this group, and indeed among the Acridinae as a whole. According to Jago (1983b: 120), the retractile ovipositor of *Platyverticula* resembles that of the



Figs 47–63. **Figs 47–56.** *Afrophlaeoba* genus group; comparison with Tribe Pargaini. **Figs 47–51.** Tribe Pargaini, male *Odontomelus kwidschwianus*: 47. Lateral aspect head from left side showing foveolus; 48. Dorsal aspect anterior left femur; 49. Lateral aspect left hind knee (outer side); 50. Oblique aspect of abdominal apex; 51. Dorsal and lateral aspect (from left side) epiphallus. **Figs 52–56.** Tribe Phlaeobini, *Afrophlaeoba* genus group, *Paralobopoma viridifrons* male: 52. Lateral aspect head from left side showing absence of lateral foveolus; 53. Dorsal aspect anterior left femur; 54. Lateral aspect left hind knee (outer side); 55. Oblique aspect of abdominal apex; 56. Dorsal and lateral aspect (from left side) epiphallus. **Figs 57–59.** *Afrophlaeoba* genus group, male abdominal apices: 57. *Afrophlaeoba usambarica*; 58. *Chokwea eucteana* **comb. n.**; 59. *Platyverticula ritchiei*. 59A. *P. ritchiei* female abdominal apices obliquely from above and from below. **Figs 60–61.** Male frontal ridge: 60. *Parodontomelus brachypterus*; 61. *Parodontomelus mazumbaiensis*. **Figs 62–63.** Male fastigium verticis from above: 62. *Parodontomelus stoltzei* **comb. n.**; 63. *Parodontomelus verticulus*. All scale lines represent 1 mm: that under Fig. 47 applies to Figs 48–50, 52 and 55; that under Fig. 51 applies to Fig. 56; that under Fig. 57 applies to 58 and 59; that under Figs 60 to 61 also; that under Fig. 59A to both figs; that under Fig. 62 to Fig. 63.

North American gomphocerine *Chloealtis* spp., which are known to oviposit in rotten wood and even animal dung, suggesting a similar highly specialized egg-laying behavior in *Platyverticula*.

The original description included a second species, *P. eucteana* Jago, 1983 from northern Zambia, which is here transferred to the genus *Chokwea* (pp. 49). The cerci are unmodified in *P. eucteana* and similar in structure to those in *Chokwea* spp.

Species notes

Platyverticula ritchiei Jago, 1983b Fig. 59, 59A

Material.—Holotype male and allotype female: SOMALIA, Kismayu, littoral dune slack in and around grounds of Wamu Hotel, 28.vii.1981, J.M. Ritchie (NHMUK).

Description.—As for the genus. Figured in Jago (1983b): 118, figs 52–56. Distinctive species with unique pronotal disc and genital structures in both sexes. Coloration in shades of dark and lighter browns, without any traces of brighter pigmentation.

Distribution.—Known only from the type locality in SOMALIA. According to the collector (cited in Jago 1983b), the species occurs under *Cordia* sp. bushes, which are approximately 1 m high x 2 m in diameter, growing within 500 m of the high tide line; this zone integrates with trees and bushes some 18 m high, forming a woodland. The bushes on the dunes are separated by bare sand.

Generic diagnosis

Afrophlaeoba Jago, 1983

Afrophlaeoba Jago, 1983b: 94.

Type species.—*Odontomelus usambaricus* Ramme, 1929: 260, by original designation.

Description.—As in the key to genera (pp. 44, 45). Of medium size, slender, superficially fairly similar to *Odontomelus*, but systematically nearest to *Parodontomelus* and *Paralobopoma*. Antennae narrowly ensiform, slender; in male somewhat longer than combined length of head and pronotum, in female always shorter. Frontal ridge very narrow with strong raised linear margins, more or less narrowed at medial ocellus, moderately divergent below. Pronotal disc rather broad, in females slightly inflated and about twice as long as wide; rear margin broadly emarginate. Lateral carinae strong, parallel or slightly divergent, in females sometimes slightly outcurved, only typical (hindmost) transverse sulcus strong, others weak or absent. Tegmina narrow, 4–5x as long as wide. Subgenital plate of male bluntly pointed, its dorsal tip enclosed by dorsal fusion of its cuticular tip (Fig. 57). Knees of hind femora unmodified, lobes rounded. Epiphallus (Fig. 17) closely similar to that in *Paralobopoma* (Fig. 16) and *Parodontomelus*. Coloration rather dull and uniform, predominantly in shades of brown.

Discussion.—Jago (1983b) illustrates the genus and gives keys to all four species.

Species notes.—No taxonomic changes are proposed, redefinition of the East African species is not attempted.

Generic diagnosis

Parodontomelus Ramme, 1929 Figs 60–63

Parodontomelus Ramme, 1929: 261.

Type species.—*Acteana brachyptera* Karny, 1915: 132, by subsequent designation.

Description.—As in key to genera (pp. 44, 45); figured in Jago (1983b): 105–106, figs 29–36. Superficially fairly similar to *Afrophlaeoba* but pronotal disc much narrower in prozona, and lateral carinae strongly divergent in metazona. Tegmina of similar length, but markedly broader than in *Afrophlaeoba*. Distinctive features are as follows: Antennae slightly flattened and broadened basally and evenly narrowing distally; in males always much longer than head and pronotum, in females sometimes shorter. Fastigium of vertex narrow and elongate; medial carinula strong, but transverse sulcus weak or absent, level with front margin of compound eyes. Disc of pronotum: length-width ratio of prozona 2.5–3.0. Tegmina short and broad; length-width ratio 2.0–2.9. Hindwing rudimentary much shorter than tegmen. Hind femora deep at base and very slender towards knee; length-depth ratio 4.2–5.1. Hind knee unmodified. Genital structures as in *Afrophlaeoba*.

Editorial comment.—Johnsen (1990) transferred *Chokwea stoltzei* Johnsen, 1983 to *Parodontomelus*. Further, since Popov's original draft, two new East African species have been added to the genus: *Parodontomelus microptilus* Baccetti, 1997 from SOMALIA, and *Parodontomelus luci* Hochkirch, 1998 from the Udzungwa Mts. of TANZANIA. Hochkirch (1998) also restored *Parodontomelus arachniformis* Jago, 1983 from synonymy. Hochkirch (1998) gives a revised key to the species; a modified version of this is presented below instead of Popov's original, as that included only three species.

Key to species in the genus *Parodontomelus* (males)

Modified from Hochkirch (1998).

- 1 Tegmina minute (0.8 mm), scarcely reaching posterior margin of the mesonotum. Posterior margin of metazona deeply indented. SOMALIA: Basso Giuba..... *microptilus* Baccetti, 1997
- Tegmina small but reaching at least the first abdominal tergite. Posterior margin of metazona not concavely indented 2
- 2 Tegmina dark brown throughout 3
- Tegmina light brown in anal area..... 4
- 3 Male frontal ridge as in Fig. 60; length/depth ratio of hind femur 4.3. TANZANIA: E. coastal forests..... *brachypterus* (Karny, 1915)
- Frontal ridge as in Fig. 61; length/depth ratio of hind femur 4.7. TANZANIA: W. Usambara Mts..... *mazumbaiensis* Jago, 1983
- 4 Smaller species, total length <20mm, hind femur <11 mm. Fastigium of vertex as in Fig. 63. Tegminal apices fall short of hind margin of abdominal tergite 1. TANZANIA: Pugu Hills..... *verticulus* Jago, 1983
- Large species, length of hind femur >11 mm. Median carinula of vertex continuous, sometimes lowered on occiput but never obsolete 5
- 5 Subgenital plate not carinulate but ending in a point. Anal area of tegmen only slightly lighter brown than pre-anal area. Hind margin of epiphallus straight. TANZANIA: Udzungwa Mts..... *luci* Hochkirch, 1998

- Subgenital plate carinulate medially on dorsal surface, posterior to supra-anal plate. Anal area of tegmina light brown, distinctly lighter than pre-anal areas. Hind margin of epiphallallic lophi concave 6
- 6 Hind femora broader (3.1 mm), length to depth ratio 4.6; upper (hind) margin of tegmina convex; tegmina longer (3.5 mm) and broader (1.55 mm) reaching midway between abdominal segments I and II; eyes longer (2.76 mm) and broader (1.73 mm) in lateral view. Inner margin of epiphallallic lophi straight. TANZANIA: Uluguru Mts. *stoltzei* (Johnsen, 1983)
- Hind femora less broad (<3.0 mm) length to depth ratio >4.8; upper (hind) margin of tegmina straight; tegmina shorter (<3.0 mm) and not as narrow (<1.3 mm) reaching or only slightly exceeding rear margin of first abdominal segment; eyes shorter (2.61 mm) and narrower (<1.64 mm) in lateral view. Inner margin of epiphallallic lophi concave. TANZANIA: E. Usambara Mts., Zanzibar, and Mafia Island; KENYA: Shimba Hills, Mrima Hill, Jilore Forest, and Gogoni Forest. *arachniformis* Jago, 1983

Species notes

Parodontomelus stoltzei (Johnsen, 1983)

Fig. 62

Chokwea stoltzei Johnsen, 1983: 53–55, figs 5, 6a-l.

Parodontomelus stoltzei (Johnsen, 1990).

Material.—Holotype male *stoltzei*: TANZANIA: Uluguru mts., Kimboza forest, 18.VII.1981 Stoltze and Scharff (ZMUC).

Description.—As in key above. Other diagnostic features include the following: antennae brownish to brownish black; exceptionally long. General coloration striking and variable; predominantly buff-pale brownish, with a contrasting dark lateral band extending from antennal sockets across genae to upper edge of lateral pronotal lobe, sometimes invading hind part of metazona of disc, then upper part of pleura and to lower side of tegmen and tapering along side of abdominal tergites. Hind knee and most of hind tibia black, hind tarsus pale brownish. Upper area of tegmen and external and internal lower areas of hind femur sometimes reddish. Large size distinctive (see measurements in Johnsen 1983).

Distribution.—E. TANZANIA: Uluguru Mts.

Parodontomelus brachypterus (Karny, 1915)

Fig. 60

Acteana brachyptera Karny, 1915: 132, by subsequent designation, Ramme, 1929: 262, 275.

Material.—Holotype female: TANZANIA: nr. Dar es Salaam (NHMV).

Description.—As in key above. Differs from the other members of genus in its combination of uniformly brown tegmina and robust hind femora and, in male, by hind femur length/depth ratio of 4.3. General coloration in dull shades of brown.

Distribution.—Known only from the type locality, but probably occurs in other local forest relicts in the coastal area.

Parodontomelus mazumbaiensis Jago, 1983

Fig. 61

Parodontomelus mazumbaiensis Jago, 1983b: 111, figs 29, 33, 43, 44.

Material.—Holotype male: TANZANIA: W. Usambara Mts., Mazumbai Forest Res., VI. 1967 (NHMUK).

Description.—As in key above. Known only from the unique male type. Similar to *P. brachypterus* in uniform brownish coloration of tegmina, but fastigium of vertex and pronotal disc narrower.

Distribution.—TANZANIA: Eastern end of W. Usambara Mountains, in relict forest.

Parodontomelus verticulus Jago, 1983

Fig. 63

Parodontomelus verticulus Jago, 1983b: 112, figs 29, 32, 35, 41, 42.

Material.—Holotype male: TANZANIA: Pugu Hills, S.W. of Dar es Salaam, II. III. 1967, N.D. Jago (NHMUK).

Description.—As in key above. Generally similar to *P. stoltzei*, but size smaller; apex of head and frontal ridge narrower, and tegmen shorter and deeper. Coloration similar to *stoltzei* but lacking light ochre facial markings.

Distribution.—TANZANIA: known only from Pugu Hills.

Editorial note.—Popov's original manuscript synonymized *P. arachniformis* Jago, 1983 under *P. stoltzei*. Although this was never actually published, Hochkirch (1998) contested the proposed synonymy and "prophylactically" restored *arachniformis*, mainly on the grounds of differences in the epiphallallic lophi. We accept his arguments, and here list *arachniformis* and the subsequently described species *O. luci* and *O. microptilus* as valid species of the genus.

Parodontomelus arachniformis Jago, 1983

Parodontomelus arachniformis Jago, 1983b: 108.

Material.—Holotype male *arachniformis*: TANZANIA: E. Usambara Mts., Kwamkora For. Res., 7. IV. 1966, N.D. Jago (NHMUK).

Description.—As in key above. Jago (1983) writes of male "Colour distinctive. Antennae black. Area between lateral carinae of frons grey or ochre, a band from base of antennae across genae being light brown to cream (sometimes fading on genae). Body with light brown dorsal stripe. Laterally dark brown stripe on head, as deep as eye, extending across lateral lobe of pronotum and occupying about upper two thirds of that lobe, or reduced in depth across head and forming black band across upper fifth of pronotal lateral lobe. Hind femora light brown, olivaceous externally, orange below and with apical quarter black. Hind tibiae black with black spines". The female coloration is however variable. Hochkirch (1998) figures the epiphallallic lophi of five species of the genus, showing differences in their outlines.

Distribution.—TANZANIA: E. Usambara Mts.; Zanzibar: Bububu; Coast region: Mafia district: Utende; KENYA: Shimba Hills, Jilore Forest, W. of Malindi; Mrima Hill Forest, S. of Kakoneni.

Parodontomelus luci Hochkirch, 1998

Description.—As in key above.

Distribution.—TANZANIA: Udzungwa Mts.

Parodontomelus microptilus Baccetti, 1997

Description.—As in key above. Differs from all other species of the genus in being micropterous rather than brachypterous.

Distribution.—SOMALIA: Basso Giuba, Belet Amin.

Generic diagnosis*Chokwea* Uvarov, 1953

Fig. 18

Chokwea Uvarov, 1953: 153–54, figs 190, 191; 156.

Type species.—*Chokwea burri* Uvarov, 1953: 154, 78, by original designation.

Description.—As in the key to genera. Of medium size, slightly more robust and less elongate than *Afrophlaeoba* and *Parodontomelus*, with somewhat shorter and broader vertex and disc of pronotum. Arcuate transverse sulcus is always anterior to mid-point of fastigium, and often submarginal along to its front edge. Shape of pronotal disc variable in width and degree of flexure of lateral carinae but providing distinctive specific characters.

Discussion.—The most widespread taxon in this genus group, being recorded from Angola and Botswana to D.R. Congo, Zambia, and Malawi to southwestern Tanzania. *Chokwea*, as originally described by Uvarov (1953), contained four new species: *burri* (the type species for the genus) from Angola; *bredoi* from Zambia; and *backlundi* and *fitzgeraldi*, both from Tanzania. The last two were removed by Jago (1983b) to his new genus *Chromochokwea*, but *backlundi* is reinstated here as a *Chokwea* sp. *Chromochokwea* Jago thus becomes a monotypic genus with *fitzgeraldi* as type species. *Platyverticula eucteana* Jago, 1983b is newly transferred to *Chokwea* because its phallic structures are more typical of that genus. In addition, Jago (1983b) described a new species *C. malawii* from the Chikangwa area of Malawi, while more recently Johnsen (1991) added another new species, *C. forchhammeri*, from the Serowe area of Botswana. Of the six current species of *Chokwea* just two, *backlundi* and *eucteana* (both from the Ufipa area of Tanzania), are recorded from eastern Africa.

The nomen dubium *Chokwea testacea* Otte, 1995 is not treated here.

Key to species in the genus *Chokwea*

- 1 Fastigium of vertex with centrally placed transverse arcuate sulcus . 2
- Fastigium of vertex with transverse arcuate sulcus well ahead of mid position, or without one..... 3
- 2 Coloration in shades of buff and light brown, tegmina similarly light brown. BOTSWANA..... *forchhammeri* Johnsen, 1991
- Coloration in shades of light and dark brown and black; tegmina in male black, in female light brown above, dark below; knees in both sexes black. MALAWI..... *malawii* Jago, 1983

- 3 General coloration including tegmina in sombre shades of brown and grey; lateral pronotal carinae strongly incurved. ZAMBIA; TANZANIA: Ufipa *eucteana* (Jago, 1983), **comb. n.**
- Coloration includes bright pigmentation, particularly strong in males; tegmina reddish, brownish, or purplish..... 4
- 4 Lateral pronotal carinae moderately incurved, markedly divergent behind the typical sulcus 5
- Lateral pronotal carinae almost straight in male, slightly divergent in female. TANZANIA *backlundi* Uvarov, 1953, **comb. res.**
- 5 Hind knee reddish without any black. ANGOLA, D.R. CONGO.....
- Hind knee black. ZAMBIA: Mbala..... *bredoi* Uvarov, 1953

Only the two species with East African distribution are considered below.

Species notes*Chokwea backlundi* Uvarov, 1953, **res. comb.**

Chokwea backlundi Uvarov, 1953: 155, 156, figs 194, 195.

Chromochokwea backlundi (Uvarov) (Jago 1983b).

Description.—As in keys to genera and species. Rather robustly built, brightly colored species. Antennae very slightly compressed basally, reaching posterior edge of tegmina in male, markedly shorter in female. Pronotal disc particularly characteristic, with large shallow puncturation and with lateral carinae straight and parallel in prozona and weakly divergent in metazona, more markedly so in female. General coloration brownish with more or less olivaceous-green pigmentation; legs a brighter green; tegmina reddish.

Distribution.—TANZANIA: Ufipa plateau.

Chokwea eucteana (Jago, 1983), **comb. n.**

Fig. 58

Platyverticula eucteana Jago, 1983b: 120.

Description.—As in the keys to genera and species. Size large and build elongate for genus. Pronotal disc with strongly incurved lateral carinae. In pronotal morphology species resembles *Platyverticula ritchiei*, but its genital structures are typical of *Chokwea*. Coloration in subdued shades of brown and grey only.

Distribution.—ZAMBIA: Abercorn, Mbala; TANZANIA: Ufipa, Mpui.

Generic diagnosis*Paralobopoma* Rehn, 1914

Figs 16, 52–56

Paralobopoma Rehn 1914: 73.

Type species.—*Paralobopoma bugoiensis* Rehn, 1914: 73, by original designation.

Description.—As in key to genera (pp. 45). Close to *Parodontomelus* and *Afrophlaeoba*, but of somewhat more robust build, with shorter head and broader disc of pronotum, less than twice as long

as wide. Antennae narrowly ensiform longer than head and pronotum together. Frontal ridge shallowly sulcate with obtuse carinae. Fastigium of vertex elongate-parabolic with weak carinula and transverse sulcus just ahead of anterior edge of compound eyes. Pronotum weakly tectiform, median carina distinct; lateral carinae weaker, straight, parallel or weakly divergent and largely obliterated in metazona. Metazona about 1/3 length of prozona, its hind margin broadly emarginate. Tegmina reduced to narrow strap-like scales, their tips about level with hind margin of second abdominal tergite. Ovipositor unspecialized; male subgenital plate as in *Parodontomelus*. Hind femora with rounded genicular lobes. Coloration as a rule includes some green pigmentation, brighter in male. Color green or brown with a yellow marginal pronotal band, and often with a broad dark lateral stripe along upper margin of lateral pronotal lobes.

Discussion.—In his revision of the genus, Jago (1983b) recognized four species. All species of the genus are found in or around the Western (Albertine) Rift Valley. *P. sjostedti* Ramme, 1931 was described from an unspecified locality in N.W. Tanzania, and is also known from extreme eastern D.R. Congo (Mt. Kabuzi, W. shore of Lake Kivu). *P. viridifrons* Jago, 1983 is widely distributed in W. Uganda. These are the only species of the genus known to occur in East Africa as it is politically defined. The other species are from eastern D.R. Congo or Rwanda. Jago (1983b) gives keys to all species. The genus is now in need of a further revision.

Species notes

As no taxonomic changes are proposed here, redefinition of the East African species is not attempted.

Genus group diagnosis

The *Ocnocerus* genus group

Description.—This genus group is part of tribe Phlaeobini. Its members share the following combination of characters. Size small, of medium fusiform build. Integument characteristically sculptured, pitted, ridged, and more or less rugose. Antennae of variable structure, greatly shortened, flattened and modified in *Hyperocnocer*, less so in *Ocnocerus* and *Anacteana* (and even less in the remaining genera), being nearly filiform and greatly elongate in some species and subspecies of *Sumba*. Head short, moderately pointed, fastigial foveolae absent; fastigium of vertex parabolic to trapezoidal. Pronotum weakly tectiform, more or less convex; medial carina weak but distinct, with lateral carinae weaker and sometimes partly or completely obsolete. Pronotal metazona shorter than prozona, its hind angle incurved or straight (*Anacteana* spp., *Rhabdoplea angusticornis*), or obtuse-angular (the remaining taxa). Mesosternal interspace open, often transverse; metasternal interspace closed or very narrow. Tegmina and wings fully developed, shortened or vestigial; micropterism may be general for a genus (*Anacteana*), or occur as a polymorphism within a species (*Rhabdoplea munda*). Wing venation and reticulation from sparse to dense when transverse veinlets become thickened and more serrated and membrane of tegmina opaquer (especially marked in *Panzia*). Hind femur moderately robust, knee lobes on both sides rounded and not expanded. External male genitalia simple, unspecialized, cerci conical. Supra-anal plate cordate; subgenital plate short, subconical. Phallic structures are of the

phlaeobine type with well-developed ancorae and spatulate lophi of variable depth and width. They bear an outer and sometimes an inner small spherical lobe and relatively short anterior and posterior processes. Uniquely, the ectophallic membrane is somewhat thickened and, on each side, bears an area of appressed, fine, silky setae (Figs 64, 65). This feature was first noted by Descamps and Donskoff (1968) in their *Sumba rubripes*, but it is common to the whole genus group, although its development in some genera, e.g. *Anacteana* **gen. n.**, is less marked. Valves of ovipositor unspecialized; lower pair with an external lateral projection. Subgenital plate with a medial projection; spermathecal duct with basal loop, medial coil and spermatheca with apical and pre-apical diverticula of somewhat variable shape (Fig. 66).

Discussion.—The *Ocnocerus* genus group includes *Ocnocerus* I. Bolívar, 1884, *Hyperocnocer* Uvarov, 1953, *Anacteana* **gen. n.**, *Sumba* I. Bolívar, 1909, *Panzia* Miller, 1929, and *Rhabdoplea* Karsch, 1893. No changes are made here in *Ocnocerus*, with its two species *bayaoi* I. Bolívar, 1889 and *diabolicus* Karsch, 1893, or in the monotypic genera *Hyperocnocer* and *Panzia*. *Acteana alazonica* Karsch, 1896 and *Acteana neavei* I. Bolívar, 1912 are not congeneric, so a new genus *Anacteana* **gen. n.** is erected here with *neavei* as the type. *A. alazonica* Karsch, 1893 is transferred to the Pargaini as the type species of *Acteana* Karsch, 1893.

Rhabdoplea is now considered to contain only two species: *R. munda* Karsch, 1893 and *R. angusticornis* Uvarov, 1953, while *R. callosa* Uvarov, 1953 is transferred to *Sumba*. The following taxa are thus now placed in *Sumba*: *granulifera*, *punctata*, *semicarinata*, and *callosa* (all Uvarov, 1953), *roseipennis* I. Bolívar, 1912, *rubripes* Descamps & Donskoff, 1968, and *exilis* **sp. n.**

Key to genera in the *Ocnocerus* genus group

- 1 Micropterous, organs of flight reduced to lateral scales 2
- Fully winged 3
- 2 Antenna simple, narrowly ensiform; lateral pronotal carinae linear, low but distinct throughout; dorsum of pronotum with callose, parallel, longitudinal ridges, especially in the metazona; hind margin broadly rounded *Rhabdoplea* Karsch, 1893 (micropterous form)
- Flagellum of antennae divided into a broadly ensiform basal part, a narrowly ensiform middle part, and a cylindrical, more or less filiform, tapering apical part (Figs 69–72); lateral pronotal carinae obsolete throughout, or at least in the metazona, sculpturing of dorsum of pronotum not in parallel ridges, hind margin of metazona straight, or emarginate *Anacteana* **gen. n.**
- 3 Antennae strongly reduced, their length equal to that of head and modified as in Fig. 73. Disc of pronotum strongly ridged and furrowed *Hyperocnocer* Uvarov, 1953.
- Antennae not strongly reduced and modified as above 4
- 4 Antennae much shorter than combined length of head and pronotum; basal segments of flagellum flat and broad, their apical angles protruding; medial segments flat and narrow, but apical ones cylindrical and tapering (Fig. 74). Pronotal disc with strongly punctate cuticle, but not longitudinally ridge or furrowed *Ocnocerus* I. Bolívar, 1889.
- Antennae ensiform, basal segments of flagellum somewhat flattened and expanded (Fig. 75), but not modified as above, their length equal to, shorter than, or longer than combined length of head and pronotum 5

- 5 As under couplet 2 above but fully winged; venation sparse, intercalary vein distinct, membrane of tegmina transparent
.....*Rhabdoplea* Karsch, 1893 (alate form)
- Venation and reticulation relatively dense, intercalary vein weak, indistinct or absent; membrane of tegmina more or less opaque. Hind margin of pronotum obtuse-angular, prozona/metazona ratio <1.2..... 6
- 6 Reticulation in apical part of tegmina and wings regular, transverse veinlets thickened and dentate (Fig. 76).....*Panzia* Miller, 1929
- Hind margin of pronotum broadly rounded, prozona/metazona ratio >1.2. Reticulation in apical part of wing and tegmen less regular, transverse veinlets not unduly thickened and dentate (Fig. 77).....
.....*Sumba* I. Bolívar, 1909

The *Ocnocerus* genus group can be divided into two genus subgroups: *Sumba-Rhabdoplea-Panzia* and *Ocnocerus-Hyperocnocer-Anacteana* (gen. n.).

Genus sub-group diagnosis

Sumba-Rhabdoplea-Panzia genus sub-group

Description.—Separated from the *Ocnocerus-Hyperocnocer-Anacteana* genus sub-group chiefly on the basis of their less modified antennal morphology.

Discussion.—These three genera have many similar morphological facies: genital structures; general habitus and sculpturing of the integument; structure of antennae, frons and fastigium; pronotum and sternum; wing shape, venation, and reticulation. Genital structures and coloration are rather unstable characters and subject to intra- and inter-specific variation. *Rhabdoplea* and *Panzia* are readily redefined, while the remaining species and subspecies are newly placed under *Sumba*.

Generic diagnosis

Sumba I. Bolívar, 1909

Sumba I. Bolívar, 1909: 288, 289.

Type species.—*Sumba roseipennis* I. Bolívar, 1912: 78, by subsequent designation (I. Bolívar 1912).

Description.—Diagnosis in key to genera above (p. 50).

Discussion.—While *Rhabdoplea* and *Panzia* can be defined on a suite of narrowly variable characters, *Sumba* is defined on characters subject to a wider range of variation. These include sculpturing of the integument which, in *Sumba*, varies from relatively fine (but always distinct) to very coarse and rugulose, although never showing the distinctive regular parallel ribbing of *Rhabdoplea*. Likewise, wing shape and venation show a wide range of variation from narrow with sparse reticulation (as in *S. roseipennis*, which is similar to *Rhabdoplea*), to broad with sparse reticulation (as in *S. granulifera*, which is similar to *Panzia*). Table 3 summarizes geographical variation in selected morphometric ratios.

The genus was first described by I. Bolívar (1909) in a key without any species included. In 1912 he described the first species, *Sumba roseipennis*. The present study reduces *S. longicornis* Ramme to a synonym of *S. roseipennis* and describes *Sumba exilis* sp. n.

from the Ngaoundéré area of north central CAMEROON and western UGANDA.

Sumba species fall into two distinct clusters: first, the widespread *S. roseipennis* species group consisting of closely related taxa, which are also similar in appearance to *Rhabdoplea* (includes *S. rubripes* and *S. exilis* sp. n.), and second, three species in the *S. semicarinata* species group, also including *S. punctata* and *S. granulifera*, together with the fourth, *S. callosa* (transferred from *Rhabdoplea*), which are local, rather distinctive endemics, of which *S. granulifera* shows some similarity to *Panzia uvarovi*.

Table 3. Geographical variation in morphometric ratios amongst *Sumba*.

	<i>rubripes</i> (mm)	<i>exilis</i> (mm)	<i>roseipennis</i> (numbered by location) (mm)				
			1	2	3	4	5
Antennal length/ pronotal length (male)	1.7	1.25	1.5	1.4	1.1	1	0.8
Tegminal length/ tegmenal width (male)	NA	8.2	7.5	7.8	7.5	7.3	7.4

Locality no.: 1. Uganda, Kepeka; 2. Zaire, Park Nat. de Garamba; 3. Tanzania, Katavi; 4. Namibia, Waterberg; 5. Swaziland, Mbabana.

Key to *Sumba* species (*semicarinata* species group) (Key 1)

- 1 Relatively slender, head pointed (Figs 78–81) sculpturing relatively smooth and shiny, not rugulose or granulose. Lateral pronotal carinae distinct, thick or linear, although weaker in the metazona. Tegmina and wings narrow (tegmen length/width ratio >6), venation and reticulation sparse 2
- More robust, head less acute, sculpturing coarse, with marked callosities and rugosities. Lateral pronotal carinae thick, callose and irregular in prozona, obsolete in metazona. Tegmina and wings broad, (tegmen length/width ratio <6), venation and reticulation dense... 3
- 2 Integument smooth and shiny, though coarsely punctured. Frontal ridge thick, not sulcate, fastigial and pronotal carinae thick and callose, hind wing hyaline*punctata* Uvarov, 1953
- Frontal ridge sulcate with well-defined margins. Fastigial and pronotal carinae linear. Hind wing colored, or infumate (but hyaline in *S. exilis*).....see *roseipennis* species group, Key 2
- 3 Head short, frons broadly concave; eye round, length/width ratio around 1.2. Fastigium of vertex very broad and short (Fig. 86)
.....*callosa* (Uvarov, 1953), **comb. n.**
- Frons in profile only weakly convex or straight; eye elongate, length/width ratio>1.2. Fastigium of vertex not unduly broad and short (Figs 87, 88)..... 4
- 4 Sculpturing coarsely rugose and callose all over head and most of thorax, but roughly aligned as longitudinal callosities in metazona of pronotum. Base of antenna narrowly ensiform. Frontal ridge not expanded between antennae. Reticulation of tegmina rather loose and very irregular. Hind wings yellow basally.
.....*semicarinata* Uvarov, 1953
- Sculpturing on head and pronotum consisting of regularly scattered rounded tubercles; basal antennal segments broadly ensiform; frontal ridge distinctly expanded between antennae. Reticulation of tegmina exceptionally dense. Hind wings rose colored at base, lightly infumate apically.....*granulifera* Uvarov, 1953

Key to *Sumba* species (*roseipennis* species group) (Key 2)

- 1 Of slender elongate build; sculpturing on occiput as longitudinal dorso-lateral row of callose ridges separated by a deep furrow; face straight, or weakly concave in profile; fastigium triangular, elongate, pointed apically (Figs 82–83). Tegmina very narrow, tapering and down-curved apically; hind wing hyaline. CAMEROON, UGANDA .
..... *exilis* sp. n.
- Of less slender and less elongate build; sculpturing fine but does not form a distinctive pattern. Face weakly convex in profile; fastigium parabolic, not distinctly pointed apically. Tegmina straight, not down-curved apically; hind wing colored, yellow, or pink basally and more or less infumate apically..... 2
- 2 Antennae exceptionally long and narrow, reaching base of hind legs in male and flattened but scarcely widened basally. Lower sulcus of hind femur and hind tibia red. D.R. CONGO.....
..... *rubripes* Descamps & Donskoff, 1968
- Of variable build, from relatively slender to robust. Antennae of variable length: as long as, shorter than, or longer than the combined length of head and pronotum, but not exceptionally long and narrow as in *S. rubripes*. No red on hind legs. Grasslands of Africa south of the Sahara *roseipennis* I. Bolívar, 1912 *sensu lato*

Species notes

Sumba roseipennis I. Bolívar, 1912
Figs 65, 66, 78–81

Sumba roseipennis I. Bolívar, 1912: 78.

Sumba nigrescens Miller, 1929: 67, figs 17, 18 (syn. Dirsh 1966).

Sumba longicornis Ramme, 1929 **syn. n.**

Material.—Holotype female *roseipennis*: ZAMBIA (MRAC, Ter-vuren). Holotype male *nigrescens*: TANZANIA, Kalula (NHMUK). Paratype male *longicornis*: CENTRAL AFRICAN REPUBLIC, Ouham River, Bozoum (NHMUK).

Further material (NHMUK, unless stated otherwise): SOUTH AFRICA: Pretoria, IV. SWAZILAND (now ESWATINI): Mbabane. NAMIBIA: Waterberg (Nat. Mus. Nam., Windhoek). ANGOLA: Villa Luso; Quirimbo, 3 mi. N. of Santa Comba; Mt. Lubiri, 6 mi. N.W. Alto Hama. D.R. CONGO: Lubumbashi; Parc National de Garamba. ZIMBABWE: Mashonaland, Harare (as Salisbury). ZAMBIA: Mbala (Abercorn), Lake Chila; Mweru wa Ntipa; Chambosi River. TANZANIA: Plateau 5 mi. S.W. of Sumbawanga; 8 mi. S. of Chala Mission; Ushirombo Road, 16 mi. W. Kahama; 13 mi. S. Biharamulo; Katavi plains; 137 kms. Sumbawanga-Mpando. UGANDA: mile 60, Mubende-Masaka; mile 35, Mbarara-Masaka; Kampala; Mbarara; Koki; Koki-Lawanda; Kapeka; Masaka; Buhimba; Msaka-Lwango. CAMEROON: 27 km N.W. Banyo, Ngaoundéré.

Description.—As in the key. Coloration similar to that in *Rhabdoplea*, in shades of stramineous and brown, occasionally in shades of grey. Greenish hues, mostly in dull olivaceous shades, occur locally and apparently represent populations from particularly wet and green habitats. Fire melanism common and may predominate in some series. Hind wings pink or yellow at base; usually somewhat infumate apically. Wing color forms often sympatric. Shade and depth of pigmentation varies, probably in relation to maturation; immature adults' wings may be colorless.

Discussion.—Geographical variation in *S. roseipennis* parallels that of *Orthochtha dasyncnemis* (Gerstaecker). Thus, the more slender, elongate individuals with narrower wings and fastigia are from D.R. Congo (Lubumbashi), and the stouter ones, with broader wings and shorter fastigia, from South Africa and Namibia; specimens from the intermediate areas and West Africa, are of an intermediate build. Antennal length and width are also variable; stouter, more robust specimens in southern Africa have shorter antennae, while more slender ones in West Africa (the original *S. longicornis*) have longer antennae. Local variability is also great in some areas (populations in some parts of Uganda and Tanzania) whose structural differences almost span the extremes of the geographical range of variation. Specimens from near Chala Mission in N.E. Tanzania are as robust as those from Swaziland (now eSwatini), while those from near Biharamulo in N.W. Tanzania are as slender as those from Lubumbashi. The phallic structures, however, exhibit no notable differences between these populations. Table 4 (p. 54) gives morphometric data on *roseipennis*.

Distribution.—A variable species of wide geographical distribution: TOGO to CENTRAL AFRICAN REPUBLIC, CAMEROON, D.R. CONGO, UGANDA, KENYA, TANZANIA, ZAMBIA, ZIMBABWE, ANGOLA, NAMIBIA, and SOUTH AFRICA.

Sumba rubripes Descamps & Donskoff, 1968

Sumba rubripes Descamps & Donskoff, 1968: 1225–8, figs 29–36.

Material.—Holotype male, allotype female: CONGO REP., Brazzaville (MNHN, Paris). Paratypes 3 males, 3 females, CONGO REP., Brazzaville; Odzala (MNHN, but donated to NHMUK).

Description.—As outlined in Key 2; differs from *S. roseipennis* in its longer and narrower antennae and different coloration. Males usually with a yellow medial dorsal band extending from fastigium to tip of tegmina; head and thorax greenish or brownish, underside yellow. Anterior and middle legs greenish, hind legs red, hind knee with some black; hind wings yellow, or rose at base, infumate apically. Some of the long paratype series are all black, presumably a result of fire melanism.

Females: coloration similar, but hind legs yellow. Table 4 gives morphometric data for *rubripes*.

Discussion.—Closely similar to *S. roseipennis*. Apparently restricted to the Congo Republic.

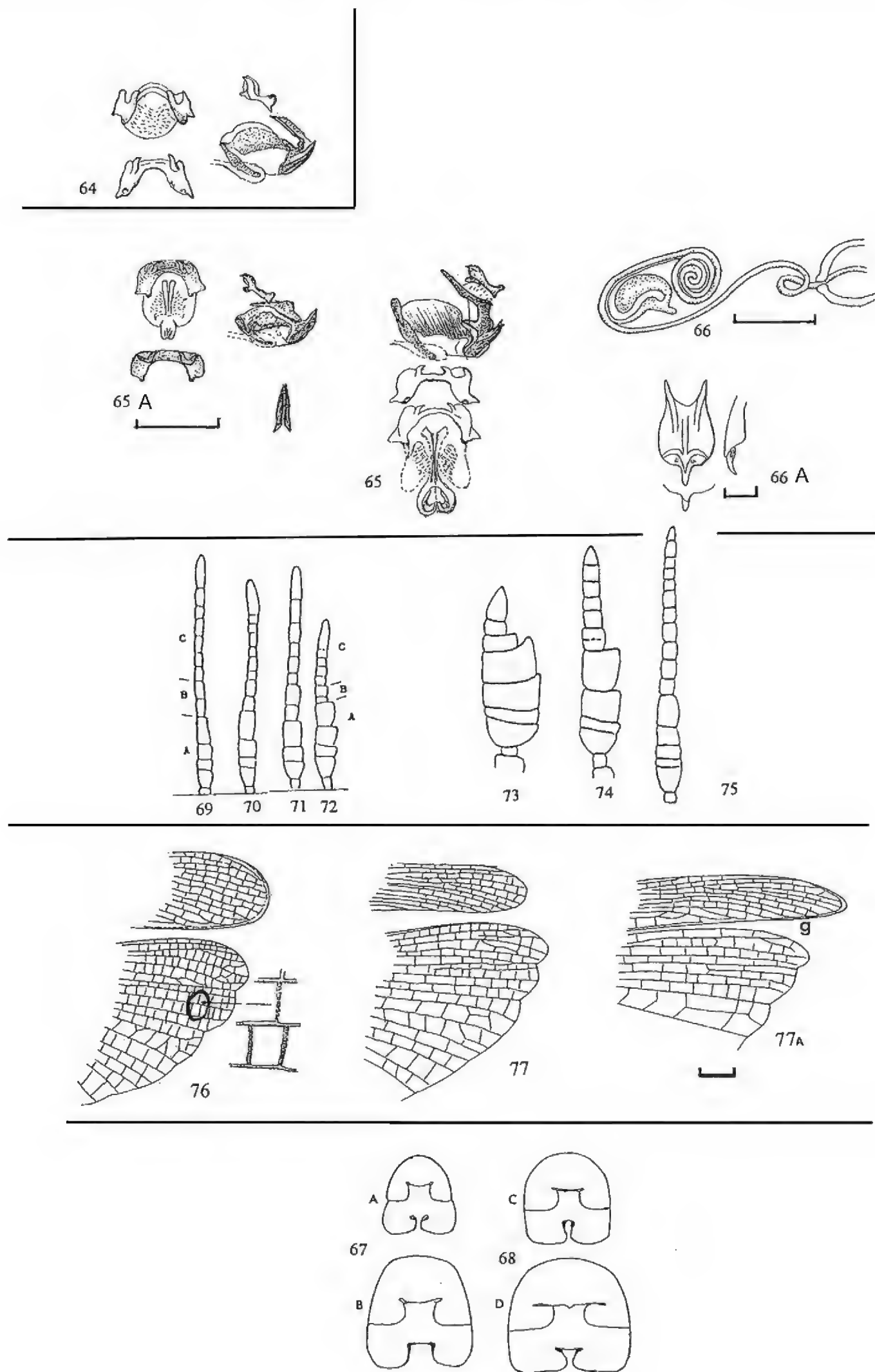
Distribution.—Known only from the original type material.

Sumba exilis sp. n.

<http://zoobank.org/F8888FBE-32D8-4C83-A574-74555BDEA80B>
Figs 65A, 77A, 82–85, 88A

Material.—Holotype male, CAMEROON: Scarp at Ngaoundéré, 23–27.XI.1980, Jago and Popov; 1 male, 1 female paratypes, same data. UGANDA: 1 female, Mbarara, 1.1934, Johnston (NHMUK).

Description.—Head and thorax coarsely sculptured in ridged shiny callosities and intervening furrows (Figs 82–83). Antennae moderately widened in basal third, cylindrical apically, in males slightly longer and in female shorter than combined length of head and pronotum. Head acute, face oblique, straight to weakly concave in profile; frontal ridge with well-defined margins, fas-



Figs 64–77. Morphology of the *Ocnocerus* genus group. **Figs 64–66.** Reproductive structures. 64, 65. Male phallic complex (lateral aspect whole complex; epiphallus and ectophallic membrane; dorsal aspect epiphallus); 64. *Rhabdoplea munda* Karsch, 1893; 65. *Sumba roseipennis* I. Bolívar, 1912; 65A. *S. exilis* sp. n.; 66. *S. roseipennis*, female genitalic complex - (66. Spermathecal duct; 66A. Subgenital plate, entire from above, tip from ventral aspect and tip from lateral aspect, left side). **Figs 67–68.** Meso- and metasterna of: 67A. *Acteana alazonica* Karsch, 1896 male, and 67B. Same, female; 68C. *Anacteana neavei* I. Bolívar, 1912 male; 68D. Same, female. (Note: *Acteana* is not a member of this genus group, it is a member of the Pargaini, but very similar to *Anacteana*. See Figs 331–340). **Figs 69–75.** Antennal morphology. **Figs 69–72.** Variation in antennae of *Anacteana n. neavei*. 69. Male Tanzania, Ufipa; 70. Female same locality; 71. Male Zambia, Mweru wa Ntipa; 72. Female, same locality. **Figs 73–75.** Antennal morphology, other genera. 73. *Hyperocnocrus sulculatus*; 74. *Ocnocerus diabolicus*; 75. *Panzia uvarovi*. **Figs 76, 77, 77A.** Fore and hind-wing apices. 76. *Panzia uvarovi* (including enlarged section showing thickened cross-veins); 77. *Sumba callosa*; 77A. *Sumba exilis* n. sp., showing longer and more pointed tegmen. All scale lines represent 1 mm: that under Fig. 66 applies to Figs 64, 65 and 65A; that under Fig. 66A applies uniquely to it; that under Fig. 77A applies to Figs 76–77A.

Table 4. Measurements of *Sumba* species (mm).

	<i>roseipennis</i>		<i>rubripes</i>		<i>exilis</i>		<i>punctata</i>	<i>semicarinata</i>		<i>granulifera</i>		<i>callosa</i>	
	M	F	M	F	M	F	M	M	F	M	F	M	F
Antennal length	5.1–5.8	6.5–7.0	8.0–9.0	7.0–8.0	6.2	6.3–8.2	6.3	7.1	5.0–6.2	6.2	5.6	6	6
Antennal width	?	?	0.3	0.25	?	?	0.42	0.42	0.5	?	0.55	0.2	0.2
Pronotal length	2.4–2.8	2.8–3.5	2.5–2.6	3.0–3.6	2.7	3.0–3.3	3	2.8	3.5	3.3	3.4	3	3.5
Prozona/metazona ratio	1.38	1.3	1.4	1.3	2.3	?	1.15	1.3	1.2	1.2	1.1	?	?
Tegminal length	12.5–13.5	13.2–15.5	11.2–12.9	12.3–14.3	14	13.0–15.0	13.7	12.0–12.8	12.8–14.5	16	16.0–17.0	13.8	14
Tegminal width	1.7	2.5	1.8	2.4	1.7	1.7–2.0	2	2.1	2.8	2.5	2.7	2	2
Length/width ratio tegmen	7.3–7.9	5.28–6.2	6.2–7.1	5.1–6.0	8.82	#	6.85	6.00	5.0	6.50	6.00	7.00	7.00
Hind femur length	8.2–10.0	10.0–12.0	9.6–10.7	10.4–11.9	9.8	9.2–10.0	8.6	8.5–9.0	10.5–11.0	11	12	9.3	11.2
Hind femur depth	1.6–1.7	1.8–1.9	1.7	1.9	1.9	2.0–2.2	1.8	2.3	2.6	2.5	2.8	2.3	2.6
Length/depth ratio hind femur	#	#	#	#	5.2	#	4.8	3.8	4.1	4.4	4.3	4	4.3
Total length	14.0–16.0	17.0–22.0	16.7–18.9	17.9–20.5	15.8	16.2–19.0	16	14.3–16.5	16.3–20.0	17.5	19.0–22.5	14	18

? = missing data
= single ratio cannot be calculated

tigial constriction marked. Fastigium longer than wide in both sexes, margins and medial carinula linear and distinct, arcuate sulcus in mid position (Figs 82–83). Dorsum of pronotum regularly tectiform, hind angle broadly rounded, carinae low but distinct; only typical and second sulci distinct; metazona/prozona ratio 2:3. Mesosternal lobes in both sexes weakly transverse, interspace longer than broad; metasternal interspace closed. Tegmina narrow, tapering and down-curved apically; venation and reticulation sparse, intercalary vein absent (Fig. 77A). External genital structures unspecialized, as in *S. roseipennis*. Phallic structures exceptionally small. Coloration in shades of light brown and stramineous, paler dorsally. Hind wings hyaline. Hind legs color of body; tibial spines black tipped. Table 4 gives morphometric data for *exilis*.

Distribution.—Known to date only from CAMEROON and UGANDA. Quite possibly, the real distribution may be less disjunct than this suggests.

Discussion.—Similar in size to *S. roseipennis*, but more slender build, sculpturing of dorsum of pronotum and colorless wings.

Sumba punctata Uvarov, 1953

Sumba punctata Uvarov, 1953: 133, figs 145, 146.

Material.—Holotype male: ANGOLA: Moxico dist. (NHMUK).

Description.—As in Key 1. Of medium size, rather slender. Integument shiny, coarsely punctured. Antenna slightly longer than combined length of head and pronotum. Frontal ridge rather thick, not sulcate, expanded above medial ocellus. Fastigium parabolic, about as wide as long, medial carinula distinct, arcuate sulcus well behind middle. Pronotal carinae thick, callose, but lateral carinae obsolete in metazona; metazona slightly shorter than prozona, its hind angle narrowly rounded. Tegmina extend beyond hind knees, venation sparse. Coloration uniformly buff with some scattered brown dots, particularly on face; sides of head and thorax somewhat darker. Wings hyaline. Table 4 gives morphometric data for *punctata*.

Discussion.—A distinctive species only known from Angola and male holotype (females unknown).

Distribution.—Known only from locality of unique holotype. ANGOLA, Moxico distr., Upper Luena valley.

Sumba semicarinata Uvarov, 1953

Fig. 88

Sumba semicarinata Uvarov, 1953: 134, figs 147, 148.

Material.—Holotype male: D.R. CONGO: Tenke, 30.VII-9.VIII.1931 (NHMUK); 1 paratype male, same data as type series. Besides the type, material examined from the following localities: 1 female, Elisabethville, 11–17.IX.1931, J. Ogilvie; 1 ♀, Sakania, IX.1931, A.A. Mackie; 1 male, 1 female, Nasantoye, XI–XII.1927, M. Burr (NHMUK); 1 male, 1 female, Lubumbashi, Bouvy (NHMUK). TANZANIA: 13 mi. S. Biharamulo; 29 mi S. Kibondo; 20 mi. S. Uvinza; 34 mi. S. Uvinza; IX.1964, N.D. Jago (NHMUK).

Description.—As in Key 1. A distinctive species in its robust build, highly sculptured, rugose integument and broad tegmina and wings. Antennae rather narrow basally, in male slightly longer and in female shorter than combined length of head and pronotum. Frontal ridge rather broad with wavy margins; fastigial constriction weak. Fastigium parabolic, rather short, medial carinula distinct, arcuate sulcus behind middle (Fig. 88). Pronotal carinae thick, lateral irregularly wavy in prozona, obsolete in metazona; metazona slightly shorter than prozona. Tegmina extend beyond hind knee, broad, not tapering apically. Venation and reticulation very irregular. Coloration variable, ground pigment somewhat speckled in shades of brown and charcoal grey; hind femur and tibia brown, hind wings yellow basally, infumate apically. Table 4 gives morphometric data for *semicarinata*.

Distribution.—D.R. CONGO, TANZANIA, ANGOLA, ZAMBIA (Dirsh 1970).

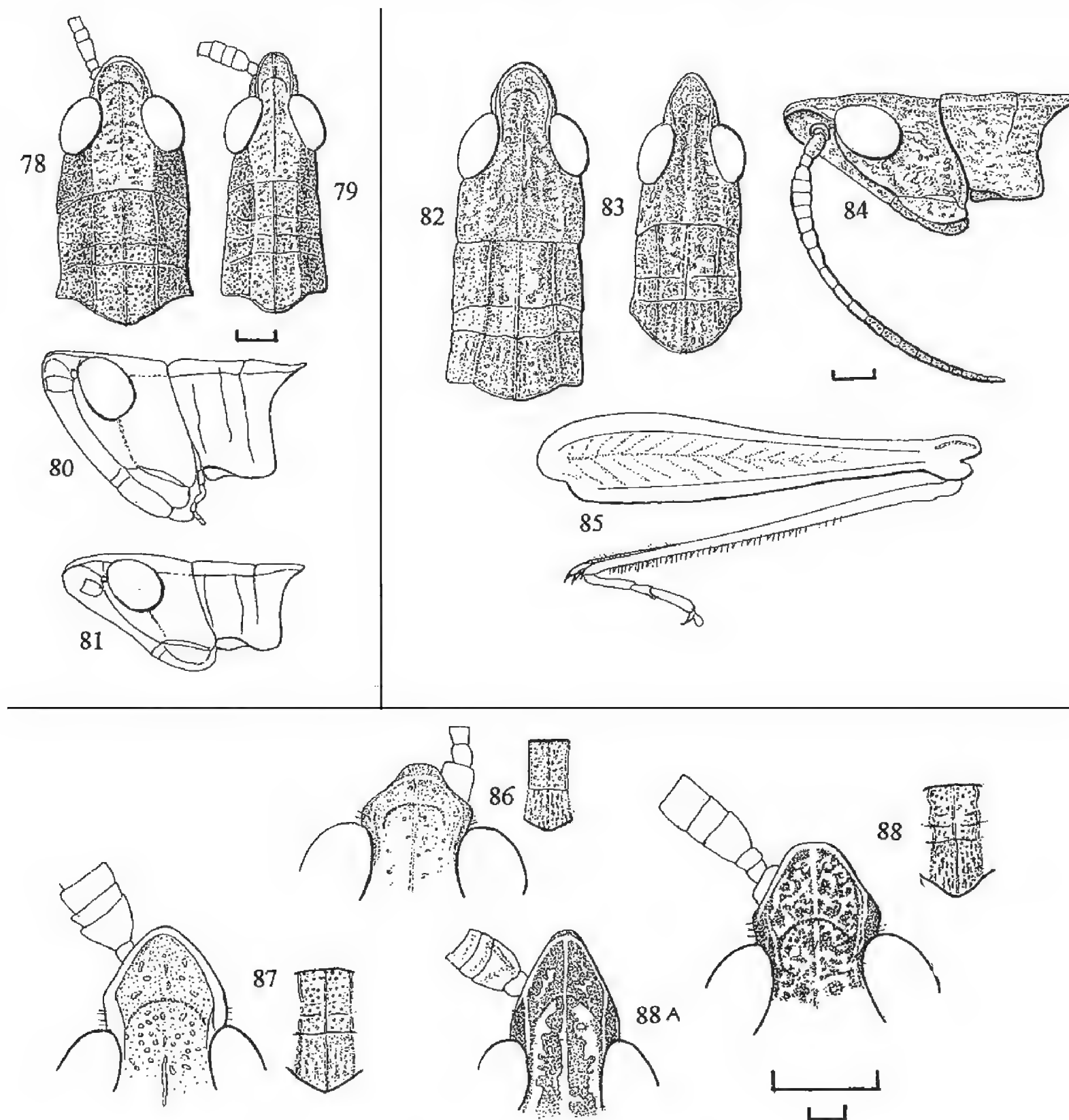
Sumba granulifera Uvarov, 1953

Fig. 87

Sumba granulifera Uvarov, 1953: 134–135, figs 149, 150.

Material.—Holotype male: ANGOLA: Villa Luso, Moxico dist. (NHMUK); 1 male, 2 females, same data as holotype; 5 females, Luchase dist.: river Lungue Bungu and river Quangu.

Description.—As in Key 1. Antennae rather wide at base and slightly shorter than combined length of head and pronotum in both sexes. Frontal ridge rather narrow, weakly expanded between antennae, fastigial constriction narrow. Fastigium as in Fig. 87, its medial carinula weak. Pronotum and head granulate, but meta-



Figs 78–88. Figs 78–85. Morphology of *Sumba* spp. 78–81. *S. roseipennis* head and pronotum: 78. Female holotype from above; 79. Male topotype from above; 80. Female holotype from left side; 81. Male topotype from left side. Figs 82–85. *S. exilis*: 82. Female paratype, head and pronotum from above; 83. Male holotype, head and pronotum from above; 84. Male holotype from left side; 85. Left hind femur of male holotype. Figs 86–88. Morphology of fastigium verticis and pronotal disc in *Sumba* spp.: 86. *S. callosa*; 87. *S. granulifera*; 88. *S. semicarinata*; 88A. *S. exilis* (fastigium only, pronotal disc not shown). Scale lines represent 1 mm: that under Fig. 79 applies to Figs 78, 80–85 and to drawings of pronotal discs Figs 86–88; that under under Fig. 88 applies also to fastigium verticis depicted in Figs 86–88, 88A.

zona longitudinally rugulose. Medial carina sharp, lateral carinae irregular in prozona, obsolescent in metazona. Tegmina broad, with very dense reticulation. Wings broad, with three anterior sectors produced and rounded apically. Genital structures of typical *Sumba* type, without specialized features. General coloration reddish-ochraceous to brownish. Antennae blackish. In some female specimens abdominal tergites have alternating broad dark and narrow light bands. Wings bright rose (ANGOLA) to vermilion (D.R. CONGO: Katanga), lightly infumate apically. Some specimens from burnt areas are dark brown with brighter colored wings Table 4 gives morphometric data for *granulifera*.

Discussion.—Similar morphologically to *Panzia uvarovi* Miller but lacking specialized venation of latter. Generally larger and more robust than other *Sumba* species and distinctive in the peculiar

granular sculpturing of its integument and the dense reticulation of the tegmina.

Distribution.—D.R. CONGO: Katanga, ANGOLA, ZAMBIA: Mbala, Kafue river at Chingola and Kabundi forest at Chingola. The habitat was given as grassland, some burnt, and *Brachystegia-Isoberlinia* woodland (Johnsen 1984).

***Sumba callosa* (Uvarov, 1953), comb. n.**
Figs 77, 86

Rhabdoplea callosa Uvarov, 1953: 141–142, figs 169–171.

Material.—Holotype male: ANGOLA: Moxico dist. river Munhanggo. (NHMUK). Type series including holotype 2 males ANGOLA,

Moxico district, Munhango river, VIII; 1 male, 4 females, Villa Luso, V; 1 female, middle Luena river, V; 1 male, Langiliko river, VI; 3 males, 4 females, Mu-Simoi river, IX–X; 3 males, 2 females, Bihe district, Cohemba, VIII; 9 males, 10 females, Luchase dist., Quangu river, 5000' (1524m), X. 1 male, 1 female, D.R. CONGO: Katanga (as Shaba) province, river Lubudi, XI.

Description.—As in Key 1. A distinctive species recognizable by its very short fastigium (Fig. 86) and round, bulging eyes. Of medium size, integument rugose. Antennae slightly longer than head and pronotum together, weakly expanded and flattened at base. Frons convex in profile, practically parallel-sided with wavy margins; fastigial constriction very weak. Fastigium very broad and short. Eyes round, large, bulging. Pronotum weakly tectiform, its surface callose and rugose; medial carina smooth, lateral carinae callose and parallel in prozona, weaker and feebly divergent in metazona. Lateral lobes deeper than long, lower margin sinuate. Tegminal apices extend beyond hind knees of folded posterior femora. Venation fairly dense with incomplete false veins (Fig. 77). Coloration mottled reddish chocolate-brown and ivory-white with brown spots. Hind femur reddish-brown with blackish dots, knee blackish. Hind tibia dirty brown with black spines.

Wings infumate, sometimes rose at base. Table 4 gives morphometric data for *callosa*.

Discussion.—This species and *S. granulifera* Uvarov, 1953 form a bridge morphologically between *Sumba* and *Panzia*.

Distribution.—ANGOLA, D.R. CONGO.

Editorial comment.—Johnsen 1984: 307 suggested that *Rhabdoplea callosa* might be synonymous with *Sumba roseipennis*, thus foreshadowing Popov's transfer to the latter genus.

Generic diagnosis

Rhabdoplea Karsch, 1893

Rhabdoplea Karsch 1893: 54, 69.

Type species.—*Rhabdoplea munda* Karsch, 1893: 70, designated by Kirby, 1910: 147.

Description.—Rather wide frontal ridge, with well-defined margins and very weak fastigial constriction; parabolic fastigium with sharp margins and carinulae and arcuate sulcus behind middle. Pronotal sculpturing distinctive, including well-defined parallel lateral carinae and longitudinal callose striations. Micropterous and macropterous forms occur; latter with rather narrow tegmina and wings with loose venation and reticulation, plus presence of a distinct intercalary vein in medial field of tegmina. Epiphallus has rather short lophi, with elongate outer lobes (Fig. 64).

Discussion.—*Rhabdoplea s. str.* now contains only the widespread *R. munda* Karsch, 1893, and the closely related *R. angusticornis* Uvarov, 1953 (ANGOLA). They share the same characteristic structure and sculpturing of pronotum and tegminal morphology described above. The medial field of the tegmina has a more transparent membrane and a rather looser reticulation than is usually found in *Sumba* spp.

Species notes

Rhabdoplea munda Karsch, 1893

Figs 21, 64

Rhabdoplea munda Karsch, 1893.

Rhabdoplea angustula Karsch, 1893 (syn. Dirsh 1970).

Rhabdoplea elegans (Karny, 1907) (syn. Dirsh 1966).

Rhabdoplea klaptoczi (Karny, 1915) (syn. Descamps & Donskoff 1968).

Rhabdoplea mira Karsch, 1893 (syn. Descamps & Donskoff 1968).

Material.—Male and female types: TOGO: Bismarckburg, (MfN, Berlin). Other specimens (*including micropterous insects): ETHIOPIA: Lake Zwai. SOUTH SUDAN: nr. Juba. UGANDA: *Kepka, *Bulumezi, *Nakasongola, *Buddu Kakuto, *Luwero, Langgo; Bwamba; Karamoja; Bugoma Forest; Adachal; Dokolo; Hoima. TANZANIA: Morogoro; Rukwa valley; Kafukola; Old Shinyanga; 30 mi. N. of Kahama.

Description.—*R. munda*, by comparison with *R. angusticornis*, has antennae somewhat shorter and broader; proportionally longer pronotal metazona; prozona/metazona ratio in *R. munda* is 1.3 (*angusticornis* 1.8); hind margin of metazona convex (straight in *angusticornis*); is micropterous, or macropterous (*angusticornis* always micropterous). General coloration in shades of light brown to stramineous, with or without some darker speckling or striation. Narrow, pale, more or less distinct band present along lower side of genae and lateral pronotal lobes; dorsum and underside generally paler. Darker shades of brown may occur in micropterous form, with the dorsum light brown and sides dark brown; narrow lateral yellowish-white band is particularly contrasting, and hind femora are rusty-orange with dark knees. Table 5 gives morphometric data for *R. munda*.

Discussion.—*R. munda* Karsch, 1893 and *R. angusticornis* Uvarov, 1953 are very similar in appearance. *R. munda* in macropterous form has wings extending well beyond the tip of the abdomen and the hind knees; in the micropterous form the wings are dorso-lateral, well separated dorsally, varying in shape, being scale-like, or attenuate, but seldom extending beyond the middle of the abdomen.

Distribution.—*R. munda* is a widespread species, found in grasslands from western Africa to ETHIOPIA, eastern, central and southern Africa.

Rhabdoplea angusticornis Uvarov, 1953

Rhabdoplea angusticornis Uvarov, 1953: 139, figs 166–168.

Material.—Holotype female: ANGOLA: Moxico and Bihe distr., Upper Luena River (NHMUK).

Description.—Differs from *R. munda* in narrower, longer antennae and in shorter metazona of pronotum with a straighter hind margin (for further details see under *munda*). Coloration as in the brachypterous form of *munda*. Micropterous. Table 5 (p. 57) gives morphometric data for *R. angusticornis*.

Table 5. Measurements of *Rhabdoplea* spp.

	<i>munda</i> (mm)		<i>angusticornis</i> (mm)	
	M	F	M	F
Antennal length	6	6	8.2	7.0
Antennal width	0.2	0.2	0.2	0.2
Pronotal length	3	3.5	3	3.6–4.0
Tegminal length	13.8	14	Other measurements as in <i>R. munda</i> (macropterous form)	
Tegminal width	2	2		
Tegminal length/width ratio	7	7		
Hind femur length	9.3	11.2		
Hind femur depth	2.3	2.6		

Discussion.—Nothing published on its bionomics, but likely to be similar to *R. munda*.

Distribution.—ANGOLA, CONGO REP. (Descamps and Donskoff 1968), RWANDA (Dirsh 1970), ZAMBIA (Johnsen 1984).

Generic diagnosis

Panzia Miller, 1929

Panzia Miller, 1929: 68.

Type species.—*Panzia uvarovi* Miller, 1929: 68, by monotypy and original designation.

Material.—Holotype male: TANZANIA: Kalula (NHMUK).

Description.—As for genus. Tegmen with broad, rounded tip, opaque membrane and dense reticulation; wing broadly rounded, with sparse reticulation and regularly spaced, strongly serrated transverse veinlets of dark apical fascia (Fig. 76). Integument rugose and tuberculate. Antennae shorter than combined length of head and pronotum in both sexes (Fig. 75); moderately ensiform basally. Frontal ridge narrow, deeply sulcate, with well defined, irregularly wavy margins and very narrow fastigial constriction. Fastigium triangular, rounded apically, about as long as wide. Pronotum relatively narrow, median carina strong; lateral carinae weak and irregular in prozona, indistinct in metazona. Metazona subequal to prozona, its hind margin obtuse angular. Mesosternal lobes quadrate with rounded angles.

Discussion.—Genital structures in *Panzia* closely resemble those of *Sumba*.

Species notes

Panzia uvarovi Miller, 1929

Figs 75, 76

Panzia uvarovi Miller, 1929: 68, pl.5 f.2; pl.9 f.39, 40.

Material.—Holotype male: TANZANIA: Kalula, 60 km S. of Tabora (NHMUK).

Description.—As for the genus. Phallic structures as in *Sumba*. Coloration uniform pinkish-brown or brownish, without any notable markings, but occasionally with a narrow medial longitudinal dorsal stripe. Hind wings bright lemon-yellow to orange with a broad outer dark fascia. Measurements in Table 6.

Table 6. Morphometric measurements of *Panzia uvarovi*.

	M (mm)	F (mm)
Antennal length	6.5–7.2	7.5
Antennal max. width	0.7–0.8	0.7
Pronotal length	3.3	3.8
Prozona/metazona ratio	1.1	1.1
Tegminal length	16.5	17
Tegminal width	2.8	3
Tegminal length/width ratio	1.76	1.8
Hind femur length	10.5	11.6
Hind femur depth	2.5	2.6
Hind femur length to depth ratio	4.2	4.5
Total length	18.0–20.0	21.0–23.0

Distribution.—Apparently highly localized in central TANZANIA. Also in ZAMBIA (Kafue National Park).

Genus sub-group diagnosis

Ocnocerus-Hyperocnocer-*Anacteana* (gen. n.) genus sub-group

Description.—Separated from the *Sumba-Rhabdoplea-Panzia* genus sub-group chiefly on the basis of antennal morphology. In *Ocnocerus* and *Hyperocnocer* the antennae are strongly shortened, and clearly divided into basal, medial and terminal portions, each with differing morphology of the flagellar segments.

Generic diagnosis

Ocnocerus I. Bolívar, 1889

Ocnocerus I. Bolívar, 1889: 89.

Type species.—*Ocnocerus bayaoi* I. Bolívar, 1889: 99, pl. 1, f. 4, 4a, by original designation.

Description.—See key to *Ocnocerus* genus group, p. 50.

Discussion.—The genus includes two species, only one of which is East African. Details are given below.

Key to species of *Ocnocerus* I. Bolívar, 1889

- 1 Antennae much shorter than head and pronotum, the basal flagellar segments strongly widened. Fastigium short and rounded
.....*diabolicus* Karsch, 1893
- Antennae about as long as head and pronotum together, and basal flagellar segments only slightly widened. Fastigium relatively long and angular..... *bayaoi* I. Bolívar, 1889

Species notes

Ocnocerus bayaoi I. Bolívar, 1889

Ocnocerus bayaoi I. Bolívar, 1889.

Ocnocerus burri Kevan, 1955 (syn. Dirsh 1966).

Material.—Holotype male *bayaoi*: ANGOLA: Duque de Bragança (original type lost); neotype chosen by Dirsh (1966). Holotype male *burri* Kevan, 1955: 74: ANGOLA: Villa Luso (NHMUK). Synonymized by Dirsh (1966): 378, who designated the neotype for the species.

Distribution.—ANGOLA: In addition to the type localities, also recorded from: Moxico Dist. and Bihe Dist. (Uvarov 1953); Dundo; Xa-Ua, R. Luita, Cuilo; Zovo, Mabete, Caungula; Roure Dondo Sombo; Alto Chicapa; Lunda; Kalakembe; Shukote (Dirsh 1966).

***Ocnocerus diabolicus* Karsch, 1893**

Fig. 74

Ocnocerus diabolicus Karsch, 1893: 63, 64, fig. 5.

Material.—Holotype female: TOGO: Bismarckburg (MfN, Berlin).

Description.—Smaller, and comparatively more slender, than *O. bayaoi*, with shorter and wider antennae (Fig. 74).

Distribution.—West Africa: all countries from SENEGAL to NIGERIA, and Northern UGANDA (Arua, Adjumani, Acholi and Karamoja) in grassland savannas.

Generic diagnosis

***Hyperocnocerus* Uvarov, 1953**

Type species.—*Ocnocerus sulculatus* Karsch, 1893, by original designation (Uvarov 1953:138).

Material.—Holotype male: TOGO: Bismarckburg.

Description.—See key to *Ocnocerus* genus group, p. 50. Similar to *Ocnocerus*, but antennae even shorter and more profoundly modified.

Species notes

***Hyperocnocerus sulculatus* (Karsch, 1893) (Uvarov 1953: 138)**

Hyperocnocerus angolensis Uvarov, 1953: 139, figs 163–165.

Material.—Holotype male, ANGOLA: Moxico dist. Villa Luso (NHMUK), (synonymized by Dirsh 1970: 421).

Description.—Antennae illustrated (Fig. 73).

Discussion.—A rare but very distinctive species, with disjunct distribution. Found in clearings in wooded grassland habitats.

Distribution.—TOGO, GHANA, ZAMBIA, ANGOLA: Route Dundo-Sombo; Cassa; Lovua; Xa-Ua, R. Luita, Cuilo. D.R. CONGO: Kalemie (05°56'S, 29°12' E), xii; Katanga (as Shaba): Mujaie, vii; Lulua: Kapanga (06°37'S 170 20'E) viii; Kasai: Kamonia (06°52'S, 20°56'E); Parc National de Garamba. UGANDA: Zoka Forest, Adjumani.

Generic diagnosis

***Anacteana* gen. n.**

<http://zoobank.org/5E9B98C8-1965-4491-9B3F-39B392D6980C>

Figs 89–96

Type species.—*Acteana neavei* I. Bolívar, 1912: 79, here designated (NHMUK).

Description.—Similar to *Acteana* in size and general appearance, but more robust. Integument as in *Acteana*. Antennae shorter than

the combined length of head and pronotum. Pronotum straight, or weakly convex in profile; medial carina low, lateral carinae weak; hind margin broadly rounded with a small medial indentation. Mesosternal lobes as in *Acteana*, with broadly rounded angles, quadrate, or transverse in female. Metasternal interspace in both sexes narrow or closed. Tegmina lateral, scale-like, as in *Acteana*, but much broader, up to half the total length. Genital structures characteristic of *Ocnocerus* genus group: epiphallus with well developed ancorae (Figs 90, 91, 96).

Discussion.—On the basis of its genital structures the new genus *Anacteana* clearly belongs to the *Ocnocerus* genus group, while *Acteana*, despite its superficial resemblance, must be regarded as a member of the *Parga* genus group. The two genera may be differentiated as follows:

- 1 Tegmina narrow, about five times longer than wide. Metasternal interspace wide (Fig. 67); hind margin of pronotum shallowly excised; epiphallus without ancorae (Fig. 31) *Acteana* Karsch, 1893
- Tegmina broad, about twice as long as wide. Metasternal interspace narrow (Fig. 68); pronotum with only a small excision; epiphallus with well-developed ancorae (Figs 90, 91, 96) *Anacteana* gen. n.

A. neavei I. Bolívar, 1912, formerly attributed to *Acteana*, is now removed to the new genus *Anacteana*, erected here to accommodate the typical *neavei* recorded from its type locality in the Katanga province of D.R. Congo, to the Ufipa-Rukwa area of Tanzania and the adjacent Lungu area of Zambia, together with *A. neavei burtti* (subsp. n.) and *A. hollisi* (sp. n.) described here. *A. neavei burtti* occurs in a broad belt across central Tanzania from around Kilosa to Tabora and Kahama, whilst *A. hollisi* is recorded from the Gabela area of western Angola.

While in their size, rugosity, robust build and micropterism, the two species are superficially alike, they differ markedly in a number of structural features, as given in the keys and the diagnoses.

Key to species and subspecies in the genus *Anacteana*

- 1 Head and pronotum as in Fig. 89, genital structures as in Fig. 90. W. ANGOLA *A. hollisi* sp. n.
- Not as above 2
- 2 Smaller (male 13–15 mm, female 15–20 mm); antennae shorter and more dentate. Genital structures as in Fig. 91. C. TANZANIA: Kilosa-Singida-Tabora-Kahama-Shinyanga areas *A. neavei burtti* subsp. n.
- Larger (male 14–15.5 mm, female 16–21 mm), antennae longer and less dentate. Head and pronotum (M) in side view (Fig. 95). Genital structures as in Fig. 96. TANZANIA: Ufipa, Rukwa areas. ZAMBIA: Mweru. D.R. CONGO: Katanga *A. neavei neavei* (I. Bolívar), stat. n.

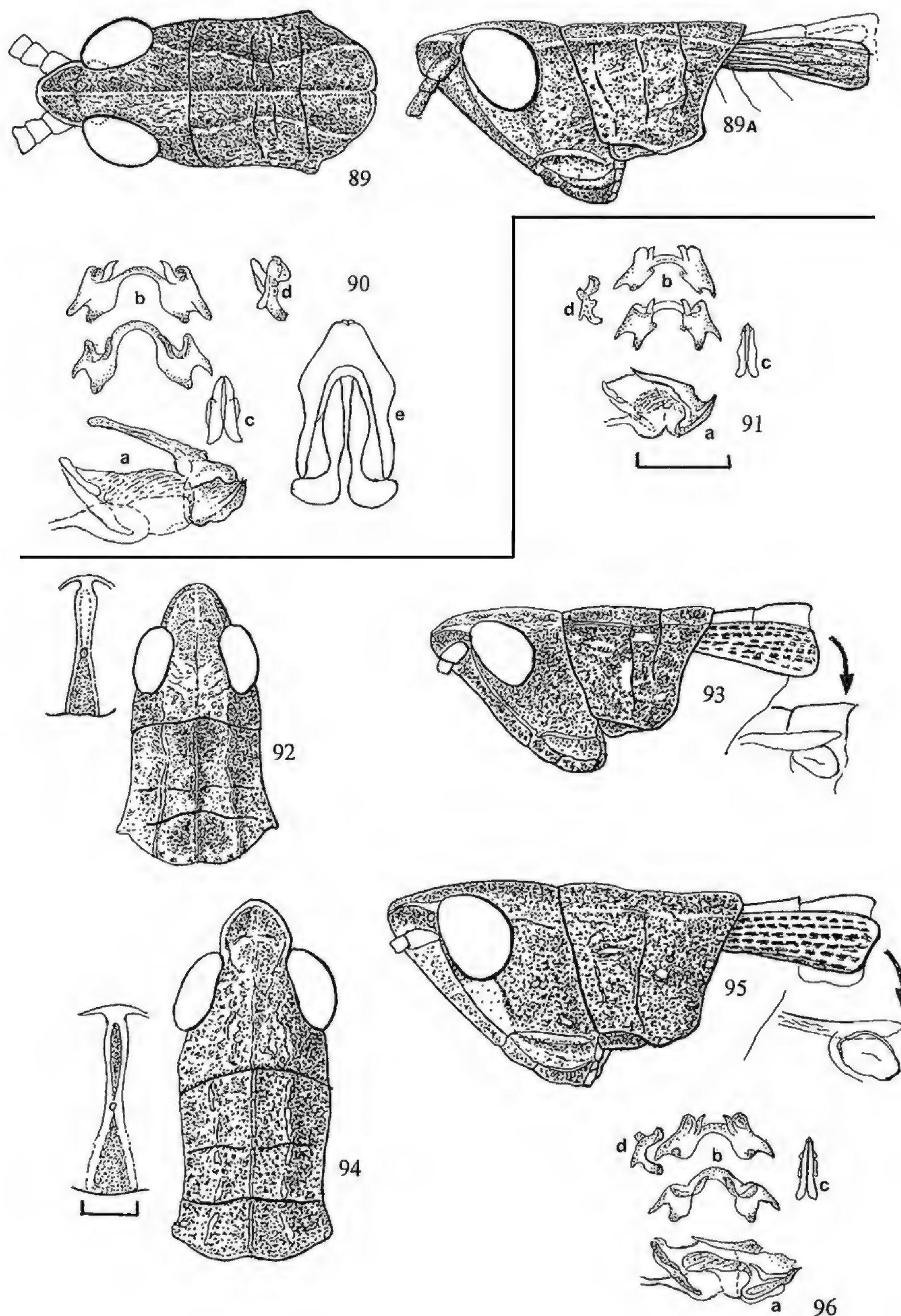
Species notes

***Anacteana neavei* (I. Bolívar, 1912), comb. n.**

Type species.—*Acteana neavei* I. Bolívar, 1912 here designated.

Material.—Holotype female: D.R. CONGO (as Congo Belge): Bunkeya-Lukafu (MRAC, Tervuren).

Description.—See below, under nominate subspecies.



Figs 89–96. *Anacteana* spp. morphology. (See also Fig. 68). **Figs 89–90.** *A. hollisi*: 89. Dorsal aspect head and pronotum; 89A. Lateral aspect head and pronotum; 90. Male phallic morphology: A. Phallic complex from left side, epiphallus removed; B. Epiphallus from two aspects (upper fig. from plane of lophi, lower fig. from vertical to lophi); C. Aedeagal valves from ventral aspect; D. Epiphallus from right side; E. Phallic complex from dorsal aspect, epiphallus removed; **Figs 91–93.** *A. neavei burtti*: 91. Male phallic morphology (explanation for lettering A–E. as for Fig. 90); 92. Dorsal aspect head and pronotum and frontal ridge; 93. Lateral aspect left side, head and pronotum; **Figs 94–96.** *A. neavei neavei*: 94. Dorsal aspect head and pronotum and frontal ridge; 95. Lateral aspect left side, head and pronotum; 96. Phallic morphology. All scale lines represent 1 mm: scale under Fig. 91 applies to Figs 90, 91, 96; scale under Fig. 94 applies to Figs 89–95, including frontal ridge and tympanic membranes. Arrowed insets to right of Figs 93 and 95 show size of hindwings and tympana concealed by tegmina.

Discussion.—Synonymies and references are given in the key and under the subspecies. This is a widespread species recorded from many localities in an area extending from north-central Tanzania to northwestern Zambia and the Katanga province of D.R. Congo. As might be expected from its micropterism and limited vagility, there is considerable geographical variation. The smaller, more slender specimens with the shortest, most dentate antennae are from Shinyanga-Kahama, and the bulkiest, with the longer, smoother and more slender antennae, are from the Ufipa-Katanga areas. At their extremes of variation, the two are sufficiently distinct to be regarded as separate species, but given the occurrence of intermediate forms, it is preferable to regard them as subspecies of *neavei*, with the typical subspecies at the southwestern and *A. n. burtti* subsp. n., named after its collector the late Eric Burtt, at the northeastern end of the range. The southern highlands of Tanzania appear to form a barrier between them.

Anacteana neavei neavei (I. Bolívar, 1912), stat. n.

Figs 68, 69–72, 94–96

Acteana neavei I. Bolívar, 1912: 79; Dirsh (1966: 38, fig. 194); Dirsh (1970: 421–2); Johnsen (1984: 302–304, figs 266A, B).

Material.—Besides Holotype – D.R. CONGO (as CONGO Belge): Bunkeya-Lukafu, (Shelford Neave) (MRAC, Tervuren). TANZANIA: 1 male, 1 female Ufipa, 17–18.xi.1963, D. Vesey-Fitzgerald, (NHMUK); ZAMBIA: 3 females, Abercorn, 30.i.1962, D.V-Fitzgerald; Mporokose Dist, Mweru wa Ntipa, 3 males, 2 females, 8–13.vii.1952; 5 males, 3 females, 20.X.1957; 1 male, 1 female, shore of Lake Tanganyika 1942, E. Burtt (NHMUK); 1 male, 2 mi. E. of Abercorn, in dry Miombo woodland, 7.X.1964; 2 males, 1 female, env. of Kalambo falls, N. of Abercorn, Miombo woodland, 4.X.1964, N.D. Jago (NHMUK). ZAMBIA (cited by Johnsen (1984: 302–304)): Chingola, Kabundi forest, in grassland within *Brachystegia-Isoberlinia* woodland, adults: VI, X & XII 1952; 5 males, 3 females, 20. x.1957; 1 male, 2 mi. E. of Mbala (as Abercorn), in dry Miombo woodland, 7.x. 1964; 2 males, 1 female, env. of Kalambo falls N. of Mbala (as Abercorn), Miombo woodland, 4.X.1964, N.D. Jago (NHMUK).

Description.—Comparatively stout, integument finely and uniformly rugulose. Antenna as in Figs 69–72. Head and pronotum as in Fig. 95; frons straight in profile. Pronotum weakly inflated in the middle; carinae low, thick and indistinct; prozona/metazona ratio 2.0–2.3 (Fig. 94); sternal plates as in Figs 68C, D. Tegmen parallel-sided with rounded apex, 1.5–2x as long as wide. Hind femur moderately robust. Genital structures as in Fig. 96, structure of epiphallus and spermatheca are particularly diagnostic. Coloration predominantly in shades of ochraceous; dorsum and sides of head and thorax, including tegmina and hind tibiae darker, and the underside and the lower sulcus of hind femur of a lighter hue; tibial spines tipped black. Otherwise no distinctive markings.

Females more uniformly colored than males.

Measurements.—In Table 7 (p. 61).

Distribution.—Cited by Johnsen (1984) (p. 302–304): ZAMBIA: Chingola, Kabundi forest, in grassland within *Brachystegia-Isoberlinia* woodland, adults: V–IX & XII. In Katanga Province of D.R. CONGO, it differs somewhat from specimens in northern ZAMBIA and the adjacent parts of TANZANIA (ca. 8° 10' S, 31° 33' E) particularly in its smaller size (17.5 mm vs. 18–22 mm) and shorter and broader tegmina (length-width ratio 1.5 vs. 2.1). However, such

differences are also found in the other subspecies and in the absence of adequate material, taxonomic distinction is not required.

Anacteana neavei burtti subsp. n.

Figs 91–93

Material.—Holotype male: TANZANIA: Shinyanga, 5.xii.1947, E. Burtt (NHMUK). Paratypes: 5 males, 6 females, same data as the type; 6 males, 5 females, Shinyanga district, Tinde, ii.1945; 4 males, 5 females, Old Shinyanga, 25.XI.1950; 4 males, 5 females, Old Shinyanga, 25.XI.1950; 1 male, ditto, 22.VIII.1953; 1 female, ditto, 3.I.1959; 1 female, ditto, Block XI, 9.xii.1949; 1 male, 17 females, Ushorombo Road, 15 and 22 mi. W. Kahama, X, XI & XII, II. 1946–1948; 3 females, Mshugha, 35 mi. S.E. of Singida, 17. XII.1936; 1 female, Singida, 14 mi. N. of Kahama, 10. VIII.1953; 1 male, 1 female, Mpwapwa Mt. Wilkins 5500' [06° 23'S, 36° 38'E], 26.XI.1948; 1 male, 2 females, Mpwapwa, 29. XI.1948; 1 male, Kibariani, 3.XII.1948 (all E. Burtt); 1 male, Galata Station, 60 mi. W. of Amani [09° 05'S, 38° 36'E], 17.VII.1937; 1 female, Lake Rukwa, 1949, G. Burnett (Paratypes: NHMUK; MRAC Tervuren; MNHN Paris).

Description.—Differs from the nominate subspecies in more slender build and, in the Shinyanga populations in particular, in smaller size. Antennae generally shorter and more dentate. Pronotum less inflated, with sharper, more distinct carinae (Figs 92, 93). The sternal plates, tegmina and genital structures (Fig. 91) also exhibit some differences from those in *A. n. neavei*. Coloration variable in shades of ochraceous, grey and darker charcoal-grey. There is often a broad, pale ochraceous dorsal stripe, particularly in males; the females are generally more uniformly colored. The underside is pale brownish, or fawn, often with fine dark speckling; lower sulcus of hind femur yellowish, tibiae dark-brown, spines tipped blackish-brown.

Measurements.—In Table 7.

Distribution.—N., C., and W. TANZANIA.

Anacteana hollisi sp. n.

<http://zoobank.org/28D22555-4D31-41C9-BF10-9573ABD96048>

Figs 89, 89A, 90

Material.—Holotype male: ANGOLA: 7 mi. W. Gabela [11.00'S, 14.30'E], 16–18.iii.1972, South African Exp. BM 1972; 2 female paratypes, same data as the Type (NHMUK).

Description.—Similar in size, but more slender than *A. n. neavei* and closer in general appearance to the larger specimens of *A. n. burtti* from Singida and Mpwapwa. Sculpturing of integument as in *neavei*. Antennae proportionately longer and less dentate than in *neavei*, equal in male and subequal in female to the combined length of head and pronotum. Dorsum of pronotum relatively narrow (Fig. 89), carinae low and thick, but distinct, lateral ones somewhat inflexed in middle; three transverse sulci distinct, metazona more than half length of prozona, its hind margin broadly rounded, medial indentation very weak in male, indistinct in female. Tegmina as in Fig. 89A. Mesosternal interspace narrower than lobe in male, quadrate in female. Hind femur slightly slenderer than in *neavei*—length/width ratio 3.7 vs. 3.2. External and internal genital structures as in Fig. 90; shapes of epiphallus and spermatheca are particularly distinctive. Coloration cryptic in shades of grey and brownish, very similar to that of *A. n. burtti*. No distinctive markings. Measurements in Table 7.

Table 7. Measurements of *Anacteana* spp.

	<i>n. neavi</i> (mm)		<i>n. burtti</i> (mm)		<i>hollisi</i> (mm)	
	M	F	M	F	M	F
Antennal length	5.5–6.3	5.5–7.0	4.2–5.4	3.8–4.2	7.4	5.4
Pronotal length	3.6–3.8	4.2–4.4	2.8–3.0	3.5–4.2	3.7	4.4
Prozona/metazona ratio	2.1	2.1	2.08	2.07	1.47	1.6
Tegminal length	2.8	3.2–3.4	2.02	2.8–3.6	2.8	3.7
Tegminal width	1.3	1.5–1.6	1.1	1.3–1.5	1.1	1.7
Tegminal Length/width ratio	2.15	2.13	3.12	2.3	2.5	2.2
Hind femur length	9.5–10.5	11.5–12.5	7.2–7.8	8.5–10.2	9.1	10.7
Hind femur depth	2.8–3.1	3.7–4.0	2.2–2.6	3.0–3.4	2.4	3.1
Hind femur length to depth ratio	#	#	3.1	2.9	3.7	3.4
Total length	15.0–16.5	17.5–22.0	13.0–15.0	16.0–20.0	15.5	22

= single ratio cannot be calculated

Genus group diagnosis

The *Duronia* genus group

Description.—Besides characteristics of male (Figs 19, 20, 97) and female (Fig. 98) genitalia, the included genera share the following characters: size medium or smaller; integument finely rugose; antennae narrowly ensiform, equal to shorter than length of head and pronotum; frontal ridge broad, sulcate, with thick margins, more or less constricted at junction with fastigium; apex of head conical, more or less pointed, fastigial foveolae absent; pronotum weakly tectiform, dorsum more or less flat, carinae strong, length of metazona equal or subequal to that of prozona, its hind angle obtuse-angular; tegmina and wings fully developed, reticulation dense, intercalary vein in medial area absent; hind femur of slender to medium build, knee lobes of equal length, outer rounded, inner acute; abdominal appendages simple, unspecialized in both sexes.

Discussion.—This group includes only four genera: *Duronia* Stål, 1876 (type species *chloronota* Stål, 1876); *Duroniella* I. Bolívar, 1908a (type species *fracta* Krauss, 1890); *Leopardia* Baccetti, 1985 (type species *bivittata* Baccetti, 1985); and *Oxyduronia* gen. n. (type sp. *anablepioides* sp. n. here described). Its position relative to other tribes and species groups is considered on p. 41. In their species composition and geographical distribution, the four genera vary considerably: *Duronia* contains just one variable widespread species recorded throughout Africa south of the Sahara, S.W. Arabia, and Madagascar; *Duroniella* contains over a dozen closely related species (some possibly synonyms), which occur in a wide belt across the southern Palearctic and the adjacent part of Eremian zone from Mauritania and North Africa to the Near East, Central Asia to China; the two remaining genera are monotypic East African endemics of very limited distribution: *Leopardia* in southern Somalia and northern Kenya, and *Oxyduronia* gen. n. in S.W. Tanzania and N. Malawi.

Key to genera in the *Duronia* genus group

- 1 Larger; males >20mm, females >30mm.....*Duronia* Stål, 1876
- Smaller; males mostly <20mm, females <30mm..... 2
- 2 Lateral pronotal carinae straight or weakly excurved, parallel; arolia large..... 3
- Lateral carinae wavy in prozona, divergent in metazona, arolia very small (Fig. 113).....*Duroniella* I. Bolívar, 1908a

- 3 Compound eye small, measured vertically smaller than sub-ocular distance. Fastigium acutely pointed (Figs 99, 100) frontal ridge at junction with fastigium strongly narrowed (Fig. 104); pronotal carinae acutely raised *Oxyduronia* gen. n.
- Compound eye larger, measured vertically equal to or larger than sub-ocular distance (Figs 101, 102). Fastigium parabolic; frontal ridge at junction with fastigium not strongly narrowed (Fig. 103); pronotal carinae not sharply raised.....*Leopardia* Baccetti, 1985

Generic diagnosis

Duronia Stål, 1876

Duronia Stål, 1876: 21.

Type species.—*Phlaeoba* (*Duronia*) *chloronota* Stål, 1876: 48 by original designation. *Rodunia* I. Bolívar, 1908a: 99 (syn. Uvarov 1953). Type species: *Phlaeoba chloronota* Stål, 1876, by original designation I. Bolívar 1908a: 100, footnote.

Description.—See genus group diagnosis and key (this page).

Discussion.—Uvarov (1953) clarified much of the hitherto existing confusion and established the generic synonymy as above. He then listed eight currently valid species attributed to the genus. Of these, *D. sanguinolenta* (I. Bolívar, 1889) was dubious since the original type is lost. Six African species were keyed; one of them, *D. curta* Uvarov, 1953, was described as new. A later revision by Dirsh (1962) reduced the eight species to two (the type for the genus *Duronia chloronota* Stål, 1876, and *D. curta* Uvarov, 1953). The rest, including the Madagascan *D. faeta* (I. Bolívar, 1890), were reduced to synonyms of *D. chloronota*.

A study of genitalia of both the sexes in a large number of specimens broadly confirms Dirsh's conclusion that *Duronia* is represented throughout its vast distribution area (including much of Africa south of the Sahara, Madagascar, and S.W. Arabia), by one variable species, *D. chloronota* Stål. Even the Madagascan populations do not differ markedly. Only in southern Africa is there sufficient differentiation to suggest subspecific status (hitherto described as *D. curta* Uvarov). Likewise, specimens from Kasewe Forest Reserve in Sierra Leone comprise individuals of very large size, with expanded, somewhat inflated pronota and basally yellow hind wings with infumate apices. These are described here as *Duronia c. curta* and *D. c. phippsi* subsp. n., respectively (the latter dedicated to its collector, the well-known entomologist-acridologist, the late John Phipps).

Species notes

Duronia chloronota (Stål, 1876)

Phlaeoba (*Duronia*) *chloronota* Stål, 1876: 48.

Phlaeoba viridula var. *liturata* I. Bolívar, 1889 (syn. Dirsh 1962).

Phlaeoba laeta I. Bolívar, 1890 (syn. Dirsh 1963).

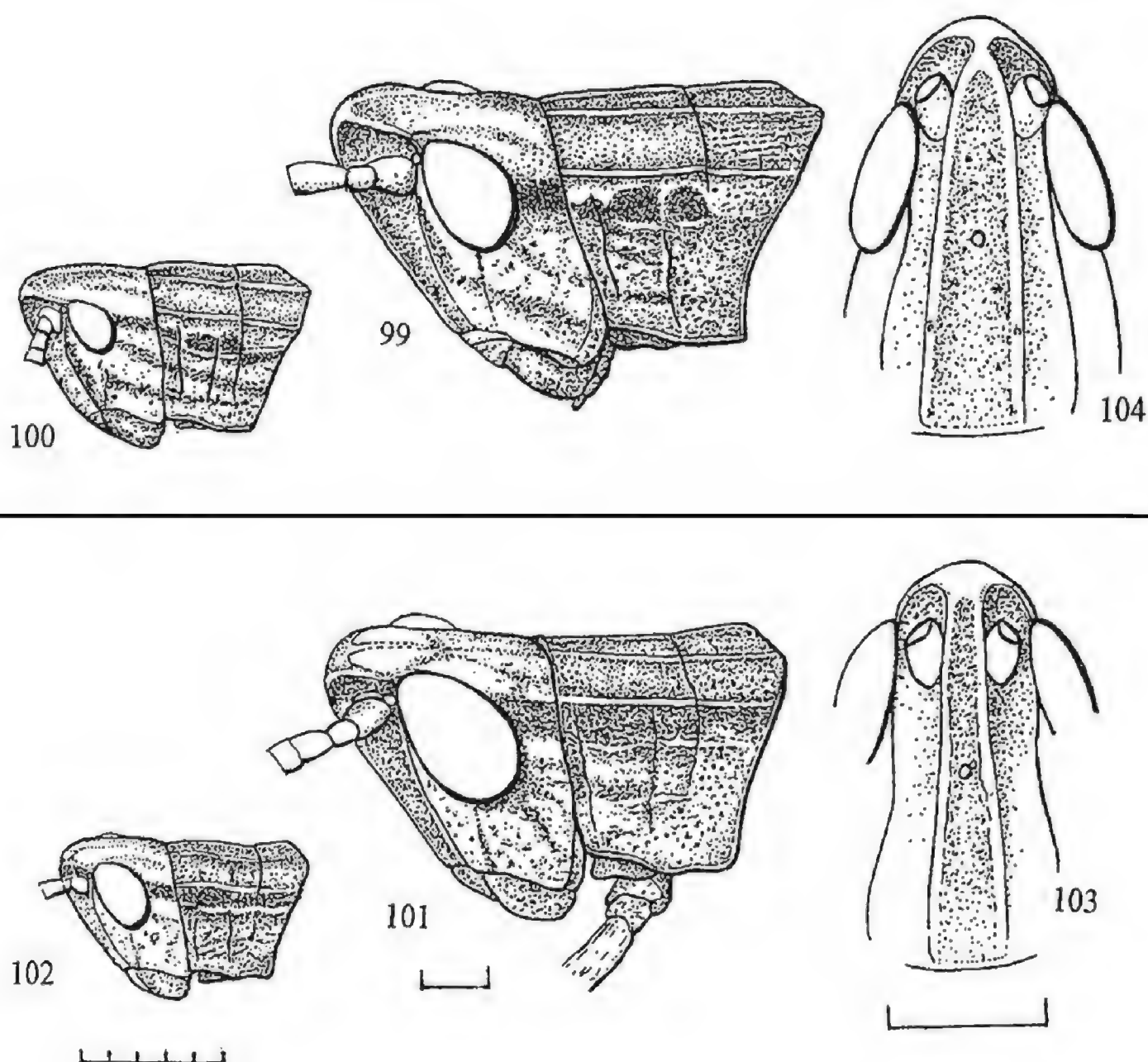
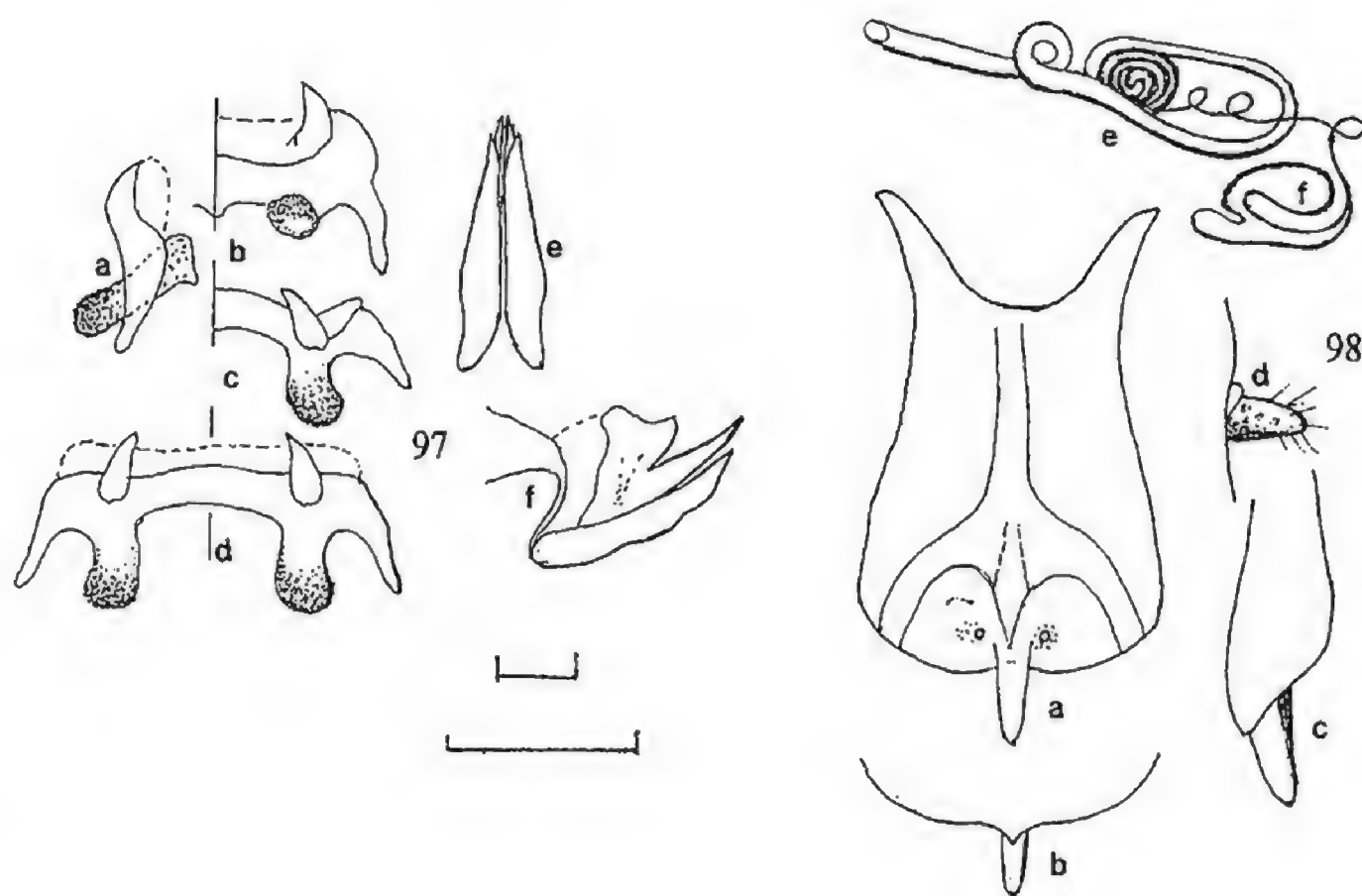
Phlaeoba tricolor Karny, 1907 (syn. Dirsh 1962).

Rodunia acuminata I. Bolívar, 1912 (syn. Dirsh 1962).

Duronia victoriana Rehn, 1914, (syn. Dirsh 1962).

Material.—Included are all the types studied by Dirsh, and also the abundant material in NHMUK collection acquired since that time.

Description.—For diagnosis see under nominate subspecies.



Figs 97–104. *Duronina* genus group. Figs 97–98. *Duronina chloronota phippsi* n. subsp.: 97. Male genitalic structures: A–D. Epiphallus, A. Laterally, B–D. Dorsally and dorso-posteriorly (B–C. Right half only); E–F. Aedeagal valves ventrally and laterally from right side, respectively. 98. Female genitalic structures: A. Subgenital plate dorsally; B. Apex of same ventrally; C. Idem, laterally from right side; D. Cercus; E. Spermathecal duct; and F. Spermatheca. Figs 99, 100, 104. *Oxyduronina anablepioides* gen.n. et sp.n. 99–100. Oblique aspect of head and pronotum; 99. Male from left side; 100. Female from left side; 104. Male frontal ridge. Figs 101–103. *Leopardia bivittata* Baccetti. 101, 102. Oblique aspect of head and pronotum. 101. Male from left side; 102. Female from left side; 103. Male frontal ridge. All scale lines under Figs 97, 101, and 103 represent 1 mm – lowermost scale applies to Figs 97 A–F, the uppermost to Figs 98 A–E; that below Fig. 101 applies also to Fig. 99; that below Fig. 103 also applies to Fig. 104. Scale under Fig. 102 represents 5 mm and applies also to Fig. 100.

Duronia chloronota chloronota (Stål, 1876)

Material.—Syntype and long series of material lodged at NHMUK, London.

Description.—Diagnosis as for genus group. Size (in mm): total length, male 20–30, female 28–44. Integument finely rugose. Antenna ensiform, somewhat shorter than combined length of head and pronotum. Head conical, face oblique, straight, or broadly convex; variable even in same locality. Fastigium parabolic with fine medial and lateral carinulae. Frontal ridge sulcate with high carinulae diverging downwards. Dorsum of pronotum flat, wide, with sharp strong carinae; lateral carinae straight, parallel, or slightly divergent backwards; only posterior sulcus crossing dorsum, metazona slightly shorter than prozona, its posterior margin obtuse-angular. Male genital structures as in Fig. 97 (*D. c. phippii*). Coloration extremely variable in shades of dark to light-brown and stramineous, often with admixture of shades of green and presence of dark lateral fascia. Dorsum predominantly in shades of brown, but occasionally in other colors, including a vivid deep pink pigmentation; sides are frequently green.

Discussion.—There is no marked constancy in color patterns; sometimes a local population may exhibit a fairly homogeneous picture, while another elsewhere presents a wide range of variation. This could be a reflection of the ecological conditions of the habitat, but precise observations are lacking.

Distribution.—The typical subspecies is by far the most widespread and variable of the three. Occurs in whole Ethiopian region except for deserts; all East African countries including SOMALIA (omitted from COPR (1982) but cited in Johnsen and Schmidt (1982) and Baccetti and Abukar (1987)); in much of southern Africa replaced by *Duronia chloronota curta* (Uvarov 1953).

Duronia chloronota curta (Uvarov, 1953), stat. n. et comb. n.

Duronia curta Uvarov, 1953: 144–145, figs 174–175.

Material.—Type material and others in NHMUK, London.

Description.—Differs from nominate subspecies in its smaller size but proportionately more robust build, shorter rounded head, and thick, practically parallel lateral carinae of pronotum. Coloration as in nominate subspecies. Size (in mm); total length: males, 22–2; females, 32–37.

Discussion.—South African species are intermediate with nominate subspp.

Distribution.—SOUTH AFRICA (former Natal, Orange Free State, and Cape Province), ZIMBABWE.

Duronia chloronota phippii subsp. n.

<http://zoobank.org/9AA00DA8-1563-4DB2-8482-80C75DC3FAF8>
Figs 97, 98, 105–107

Material.—Holotype male: SIERRA LEONE, Kasewe Forest Reserve, 22.XI.1964 NHMUK. 20 male, 20 female paratypes, same data, NHMUK.

Description.—Differs from other subspecies in its more robust build and larger size. Proportionally longer and more expanded antennae; frontal ridge as in Fig. 107, markedly narrowed at junction with fastigium. Pronotum somewhat inflated, dorsum with strong, raised carinae; lateral carinae somewhat outflexed. Pronotal metazona length of prozona, its hind angle sharp, slightly attenuate (Figs 105, 106). Coloration deep green dorsally, brownish laterally with fine, sparse, dark speckling; hind wings hyaline to faintly yellowish basally, infumate apically. Size (in mm); total length: males, 22–25; females, 32–37.

Discussion.—Habitat is moist grassland in forest clearings.

Generic diagnosis

Durioniella I. Bolívar, 1908a

Durioniella I. Bolívar, 1908a: 100.

Type species.—*Duronia fracta* Krauss, 1890: 260 (I. Bolívar 1908a), by original designation; (but given as *Durioniella lucasii* (I. Bolívar, 1881) by subsequent designation in OSF (Cigliano et al. 2018)).

Description.—As in description of genus group and key to genera.

Discussion.—A widespread genus of a dozen or so closely related species, some of which are possibly synonyms. Genus in need of revision. Only species so far recorded in East Africa is *Durioniella acuta* Uvarov, 1952. The reduced arolia correlate with the marked geophilous tendencies of members of the genus.

Species notes

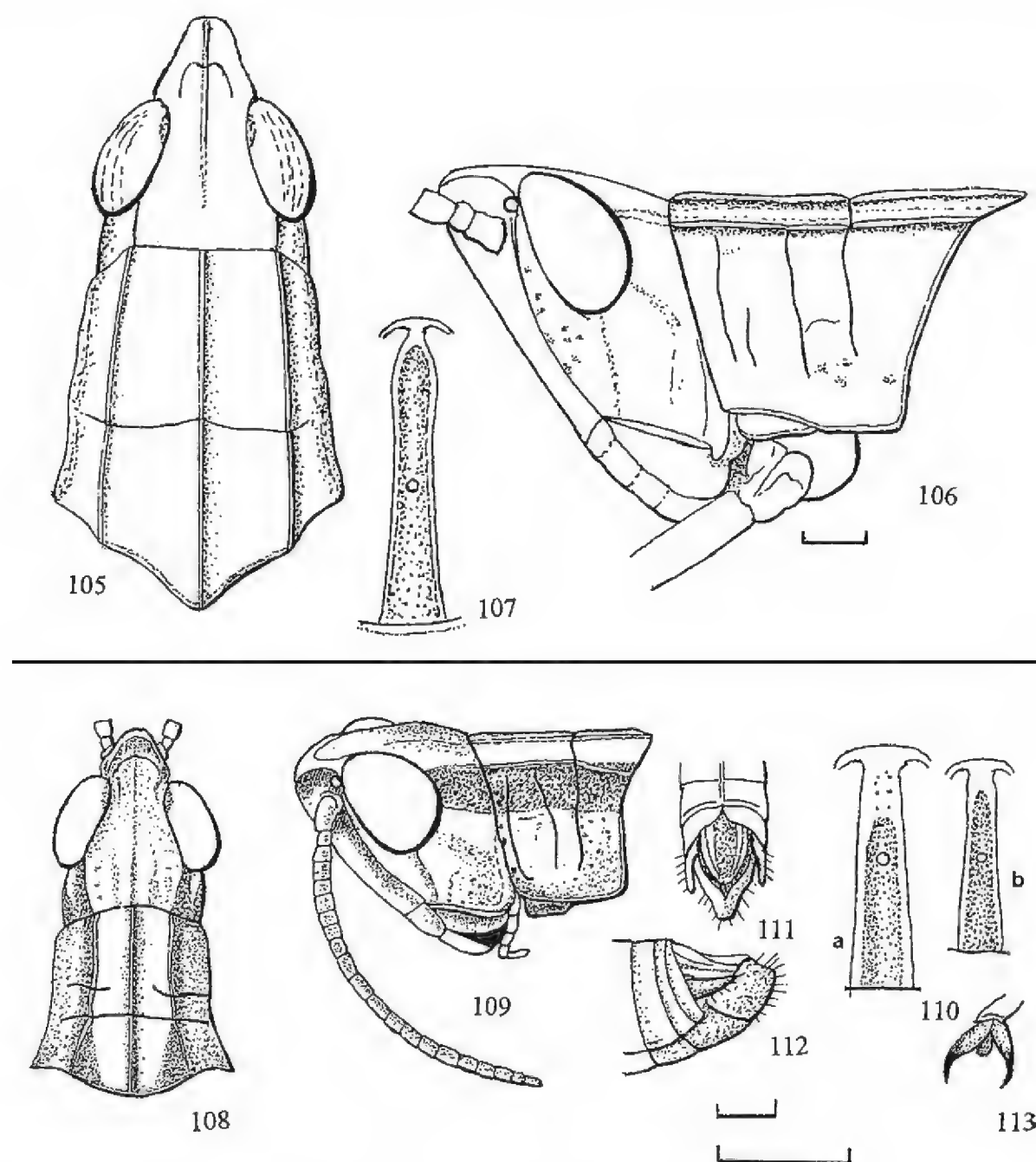
Durioniella acuta Uvarov, 1952

Figs 108–113

Durioniella acuta Uvarov, 1952: 42, 180.

Material.—ERITREA: Archico, X; Wakhiro, XI; Ghibdo valley 30 mi. W. of Assab. ETHIOPIA: Paradisso, IX. SOMALIA: Bihendulah, 25 mi. N.W. Berbera, X; Tug Hodna E. of Karin, III; Las Dureh plain, XII. (Also, Red Sea coast of Saudi Arabia and Yemen south of 20°N).

Description.—Slightly below medium size. Size (in mm): males 17.5–19.5, females 25.0–26.5. Head and pronotum as in Figs 108, 109. Integument matt to finely rugulose. Antennae narrowly ensiform; in male longer than, in female shorter than, head and pronotum. Frontal ridge moderately sulcate (Fig. 110), with thick, somewhat wavy margins, weakly divergent downwards. Fastigium of vertex moderately prominent, longer than broad; apex acutely parabolic. Pronotal disc weakly tectiform, smooth, carinae low, but distinct throughout; lateral carinae weakly inflexed in prozona, divergent in metazona. Pronotal metazona 0.8x length of prozona, its hind angle obtusely angulate. Tegmina extend beyond hind knees, membrane semitransparent; intercalary vein in medial area present. Hind femur slender; arolia very small (Fig. 113). External genital structures as illustrated in Figs 111–112. Coloration in buff and pale green variants; a faint dark fascia extends from antennal socket through genae and upper side of lateral pronotal lobes to medial area of tegmina, where it is bordered by a contrasting pale green stripe along costal area; hind wings hyaline; hind femur, including knee, a darker shade of brown than dorsum; hind tibiae pinkish brown. Green forms with pastel green sides are found predominantly among females.



Figs 105–113. *Duronia* genus group. Figs 105–107. *Duronia chloronota phippsi* n. subsp.: 105, 106. Head and pronotum dorsally and from left side, respectively; 107. Frontal ridge. Figs 108–113. *Duroniella acuta* Uvarov: 108, 109. Male head and pronotum from above and oblique view, respectively; 110. Frontal ridge A. Male; B. Female; 111. Male abdominal apex from above; 112. Male abdominal apex from oblique aspect, left side; 113. Tip of hind tarsus showing small pulvillus. All scale lines represent 1 mm: of two scales under Fig. 112, only uppermost applies to Figs 105–112, while lowermost applies to Fig. 113.

Discussion.—Comparison of the East African material with the types of *D. acuta* from Saudi Arabia, the types of *D. cooperi* Uvarov, 1943 from Egypt, and *D. lucasii* (I. Bolívar, 1881) from North Africa, shows East African material to be conspecific with the Arabian *D. acuta* (only differing in minor details such as smaller size and paler coloration). This species is closely related to the Egyptian *D. cooperi*, but both are quite distinct from the North African *D. lucasii* on the basis of phallic morphology. Records of *D. lucasii* from Somalia (cited in Johnsen and Schmidt 1982) should be considered a misidentification.

Distribution.—ERITREA, ETHIOPIA, SOMALIA, SAUDI ARABIA, YEMEN.

Generic diagnosis

Leopardia Baccetti, 1985

Leopardia Baccetti, 1985: 299.

Type species.—*Leopardia bivittata* Baccetti, 1985: 305, by monotypy.

Description.—The diagnosis of the genus is as in the key to genera; for species see below.

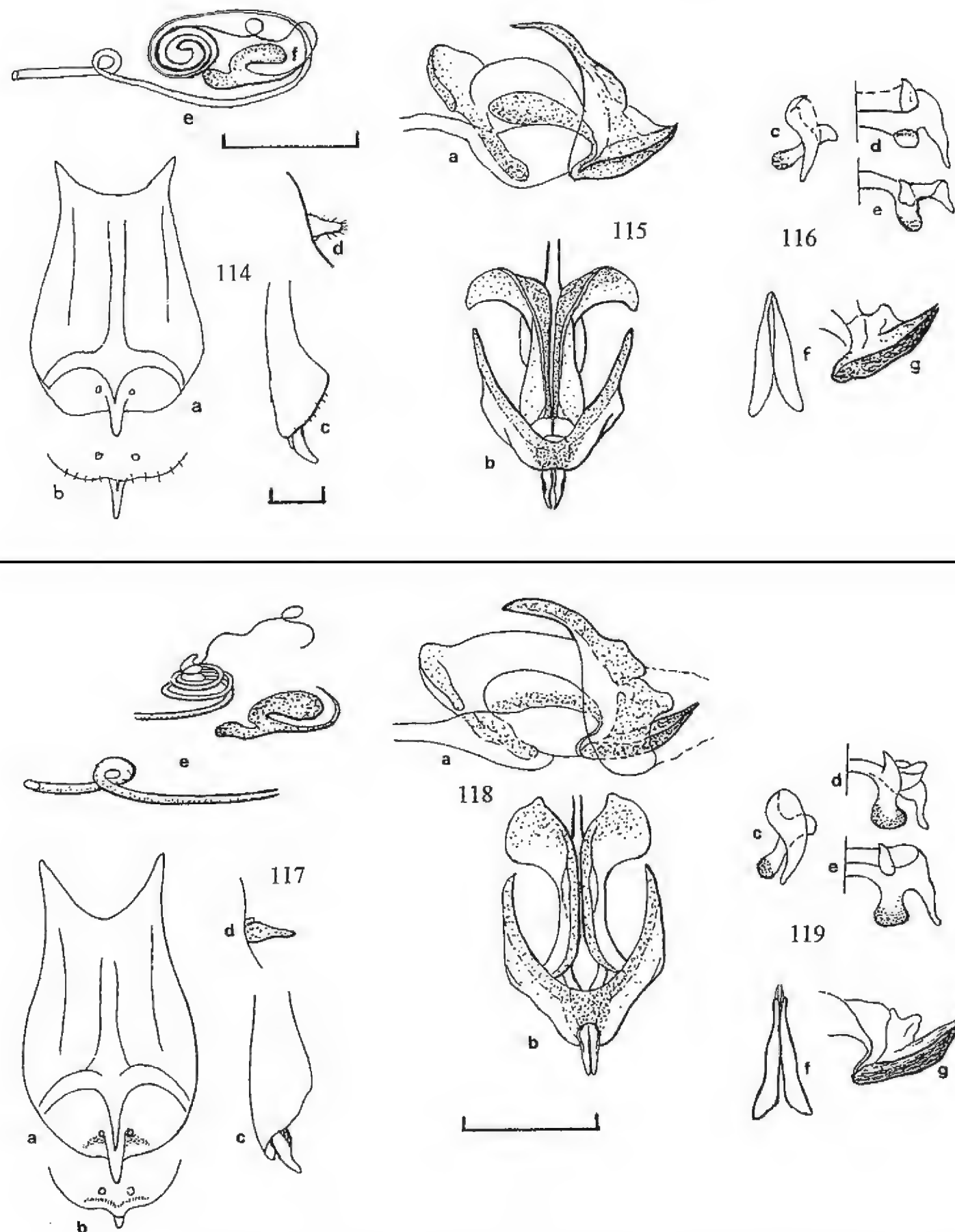
Species notes

Leopardia bivittata Baccetti, 1985

Figs 101–103, 114–116

Material.—SOMALIA: Giohar; Misciani (Genale) (Type localities); Nr. Afmadu; Mogadiscio. KENYA: 22 km N.W. of Witu along road to Garsen (02° 18'S, 40° 17'E) 65 m. Dry thicket with lush roadside grass; Hola (01° 30'S, 40° 00'E); Yasere, Moyale Dist. (03° 30'N, 38° 55'E). Grass and thorn bush, Adults: VI, XI, XII.

Description.—Below medium size. Size (in mm): total length males 17–20, females 25–33. Integument moderately shiny, finely pitted, somewhat pilose. Antennae narrowly ensiform, in male slightly longer, in female shorter, than combined length of head and pronotum. Head short, acutely pointed with oblique, straight, to weakly convex frons. Frontal ridge broad, margins thick, well-defined, weakly divergent downwards; fastigial constriction weak (Fig. 103). Fastigium of vertex parabolic, with well-defined medial and lateral carinulae and arcuate sulcus in forward position; surface of fastigium flat to weakly convex, meeting frons at an acute angle to form a sharp overhang above antennal fossae; lacking foveolae. Pronotum weakly tectiform, dorsum in metazona and anterior part of prozona finely pitted; front margin straight, hind



Figs 114–119. *Duronia* genus group. Genitalic structures: **Figs 114–116.** *Leopardia bivittata*: 114. Female subgenital plate dorsally; **B.** Apex of same, ventrally; **C.** Idem laterally; **D.** Cercus; **E.** Spermatheca and duct; 115. Phallic complex, epiphallus removed, **A.** Laterally, **B.** Dorsally; 116. Male dissected phallic components, **C–E.** Epiphallus laterally, dorsally and dorso-posteriorly (right half), aedeagal valves, **F.** Ventrally and **G.** Idem, laterally. **Figs 117–119.** *Oxyduronina anablepioides* n. gen. et sp. n.: 117. Female, **A.** Subgenital plate dorsally; **B.** Apex of same ventrally; **C.** Idem laterally; **D.** Cercus; **E.** Spermathecal duct and spermatheca; 118. Male, lateral and dorsal aspect phallic complex, epiphallus removed: **A.** Laterally, **B.** Dorsally; 119. Dissected phallic components, **C–E.** Epiphallus laterally, dorsally and dorso-posteriorly (right half), **F.** Aedeagal valves ventrally, **G.** Idem, laterally. Scale lines all 1 mm: Scale under Fig. 114C refers to Figs 114A–D and 117A–D, scale under Fig. 114E refers to Figs 114E and 117E, and scale under Fig. 118B refers to Figs 115, 116, 118, and 119.

margin obtuse-angular; medial carina strong, lateral carinae weaker, but well defined throughout. Only hind sulcus distinct, interrupting all three carinae. Metazona distinctly shorter than prozona in both sexes; lateral pronotal lobes with sinuous, ascending lower margin and rounded posterior and anterior angles; a strong longitudinal callose ridge, parallel to, and somewhat below, the upper margin, with area between darkened, a character more pronounced in females (Figs 101, 102). Mesosternal lobes weakly transverse, interspace length/width ratio 3:2 in males, 1:1 in females. Tegmina narrow and tapering, with parabolically rounded

apex, not quite reaching hind knees in either sex; membrane semi-transparent, reticulation sparse, intercalary vein in medial area weak or absent. Hind wings distinctly shorter than tegmina. Hind knees with short, rounded outer and subacute inner lobes. Tibiae length of femora, spines moderately long, inner spurs twice length of outer. Male abdominal appendages as in Figs 111–112. Ovipositor with short, robust valves, curved at apices; lower valves without basal tooth. Internal genital structures as in Figs 114–116, rather similar to those in *Duronia*; hind margin of subgenital plate without marked medial projection. Coloration marbled and speckled

in shades of brown and stramineous, with dorsum occasionally greenish (more often so in males). Lateral dark fascia varies in intensity, extending from antennal pits along upper margin of lateral pronotal lobes, sometimes filling much of the space between lateral pronotal carinae and ridge on lobe and thence to medial field of tegmina. Tip of abdomen in males yellowish of varying intensity, probably in response to sexual maturation. Hind femur brown, hind knee and base of tibia more or less dark, more intensely in males; hind tibiae brownish with spines tipped black.

Distribution.—SOMALIA, KENYA.

Generic diagnosis

Oxyduron gen. n.

<http://zoobank.org/B8114A7E-BB30-404D-B0F8-63F600040C6B>

Type species.—*Oxyduron anablepioides* sp. n., here described and designated.

Description.—Below medium size, of medium build. Integument finely rugulose, matt, weakly pilose. Antennae relatively thick, narrowly ensiform, somewhat shorter than length of head and pronotum. Head short, apex sharply pointed; frons oblique, straight to weakly convex in profile. Frontal ridge broad, deeply sulcate with thick margins divergent downwards and narrowly constricted at junction with fastigium. Fastigium of vertex broad, acutely parabolic, its surface convex, meeting the frons at acute angle, forming a projecting sharp overhang above antennal fossae; temporal foveolae absent; carinulae low but distinct, positioned along margin; arcuate sulcus weak, well in front of the middle. Compound eye small, narrowly pointed apically; sub-ocular distance greater than longest diameter of eye in both sexes. Pronotum weakly tectiform; dorsum finely pitted and ridged especially in metazona and anterior part of prozona; anterior margin straight to weakly curved, hind margin obtuse angular with slightly produced rounded apex. Pronotal carinae sharp and raised; lateral carinae straight to outflexed, particularly in female; parallel to weakly divergent caudad, particularly in male. Only typical sulcus distinct on dorsum, interrupting all carinae; metazona subequal to prozona in both sexes. Lateral pronotal lobes flat to weakly concave with irregular ridges and callosities; a submarginal ridge is present below its upper margin but is less marked than in *Leopardia*; lower margin parallel to upper in its posterior part and ascending in its anterior half; lower hind angle sharp. Mesosternal lobes transverse with rounded angles, interspace wide. Tegmina narrow with parabolic, tapering and somewhat swept back apices; reticulation moderately dense; intercalary vein in medial area weak or absent. Hind wings narrow, pointed and distinctly shorter than tegmina. Hind femora moderately slender; hind knee with lower outer lobe short and rounded, inner subacute. Hind tibiae slender, slightly shorter than femora; inner spurs twice length of outer; arolia large. Abdominal appendages in male unspecialized, elongate and slender; concealed genital structures similar to those in *Duron* and *Leopardia* (Figs 117–119). Epiphallallic bridge (Fig. 119) moderately robust, arched and without median process; lophi digitiform, markedly widened and flattened but not upturned apically; posterior projections elongate and slender. Aedeagal valves as in Fig. 118. Ovipositor with short robust upturned valves; lower valves without basal tooth. Structure of spermathecal duct (Fig. 117) and spermatheca similar to that in *Duron*; subgenital plate with rounded median projection.

Discussion.—Genus monotypic. In its general characteristics, and particularly its genital structures, it is like *Leopardia*, and is a fairly close relative of *Duron*. However, the structure of head and pronotum in *Oxyduron* is sufficiently distinctive to fully warrant generic recognition.

Species notes

Oxyduron anablepioides sp. n.

<http://zoobank.org/47DD2570-EC4F-49FE-9D07-EC687A96D819>
Figs 99, 100, 104, 117–119

Material.—Holotype male: S.W. TANZANIA: Ufipa plateau, 16 mi. N.N.W. of Sumbawanga, Mkundi Plantation, 16–27.V.1966, N.D. Jago (NHMUK). Paratypes: 3 males, 1 female, same data as holotype; 1 female, Ufipa, Malenja, 1.IV.1950, H. Backlund; 1 male, Ufipa, Nsangu, 7000' (2134 m) 13.III.1959, Vesey-Fitzgerald. MALAWI: 1 male, N. Rukuru, Nyika Plateau, 18.III.1967, Whellan (NHMUK).

Description.—As for genus. Size (in mm): total length: males 18–20, females 32–34. Antennae in male subequal to equal, in female distinctly shorter than combined length of head and pronotum. Tegmina not quite reaching hind knee. Coloration both sexes in shades of green and brown; dorsally grass-green, sides marbled and spotted in varying shades of brown, except for green longitudinal stripes in upper part of lateral pronotal lobes and anal and precostal areas of tegmina. Membrane of tegmen thicker and brown basally, semi-transparent and pinkish apically; hind wing hyaline, faintly infumate apically. Hind femora including knee, brown; outer face with more or less pronounced greenish wash. Hind tibiae dirty brown, spines tipped blackish-brown. Underside brownish.

Distribution.—S.W. TANZANIA: Ufipa Plateau and N. MALAWI.

2.2 The tribe Gymnobothrini

Tribal diagnosis

Introduction.—Some taxa have been reviewed here based on literature descriptions only. This study is, therefore, preliminary and does not resolve all the taxonomic complexities of this group. The genus *Gymnobothrus*, in particular, will ultimately require a more thorough revision.

Description.—As defined on p. 41.

Discussion.—Included genera: *Brachybothrus* gen. n., *Chirista* Karsch, 1893, *Comacris* I. Bolívar, 1890, *Coryphosima* Karsch, 1893, *Guichardippus* Dirsh, 1959, *Gymnobothrus* I. Bolívar, 1889, *Malcolm-burria* Uvarov, 1953, *Oxybothrus* Uvarov, 1953 (as yet not recorded in eastern Africa), *Rastafaria* Ramme, 1931, *Roduniella* I. Bolívar, 1914, *Tenuihippus* Willemse, 1994, and *Zacompsa* Karsch, 1893.

This review presents the genera alphabetically. *Gymnobothroides* Karny, 1915 syn. n. and *Phloeochopardia* Dirsh, 1958 syn. n. are newly synonymized under *Gymnobothrus*. In the taxonomic treatments below, generic diagnosis of monotypic genera requires reference to the key (p. 67 below), while the fuller diagnostic description is given under the species.

These twelve genera have similar genital structures (Figs 24–30), notably a very distinctive epiphallus with elongate digiti-

form lophi, and are thus regarded as a closely related group, here given the rank of a tribe within Acridinae. Externally they resemble members of the *Sumba* genus group, but unlike them do not have specialized antennae or peculiar sculpturing of the integument. The single *Rastafaria* species is micropterous, *Brachybothrus* **gen. n.** and *Guichardippus* species are brachypterous, and *Coryphosima* and *Gymnbothrus* species exhibit all stages of wing development; the remaining genera are all fully winged. While most are terri-graminicoles, some are graminicoles, and the two *Brachybothrus* **gen. n.** species are geophilous and have reduced arolia. Most of the genera contain few species, each with a rather limited geographical distribution, with the exception of *Coryphosima* and *Gymnbothrus*, which are fairly large genera containing widespread species. Critical characters, such as the structure of the vertex of the head and the pronotum, are often highly variable both geographically and within a population. Species have often been erected erroneously and extensive synonymy is frequently necessary. Thus Dirsh (1965) listed 11 species of *Coryphosima*, but five years later he attributed 16 synonyms to *Coryphosima stenoptera* (Schaum, 1853) (Dirsh 1970), five of which he regarded as valid species in 1965. Jago (1970) also discussed such complexities. Species are best defined on a combination of characters. Detailed structure of head and pronotum is useful in this respect, but the genital structures much less so. As a whole, the genera within this tribe are very similar and rather difficult to distinguish without careful examination.

Coloration, as in many Acridinae, is variable and usually several variants occur sympatrically. However, in some cases, the coloration of the lower inner and outer face of the hind femur provides a stable diagnostic feature.

Key to East African genera in the tribe Gymnbothrini

- 1 Frontal ridge very narrow at junction with fastigium and broadly widened towards clypeus; medial pronotal carina lamellate, raised and deeply notched by typical transverse sulcus. D.R. CONGO, W. TANZANIA *Malcolmburria* Uvarov, 1953
- Margins of frontal ridge sub-parallel, or weakly divergent; fastigial constriction not unduly marked. Medial pronotal carina linear, not lamellate and raised 2
- 2 Antennae narrowly ensiform, widened and compressed basally, cylindrical apically. Fastigium of vertex pointed (Fig. 121; Figs 316–317). Pronotum weakly tectiform with almost straight well-developed lateral carinae reaching hind margin and weakly divergent caudad. Fully winged; of slender build (similar to *Sumba*) 3
- Not with above combination of characters; in particular, lateral carinae not straight and not reaching hind margin of pronotum 4
- 3 Size slightly larger, of average build (male 12–15 mm). Fastigial foveolae absent, metazona roughly the length of prozona. Fastigial foveolae absent, metazona roughly length of prozona. CAMEROON, UGANDA, KENYA, D.R. CONGO; locally common in wet habitats .
..... *Roduniella* I. Bolívar, 1914
- Size very small (male 11–12 mm), of very slender build. Fastigial foveolae present, metazona 1.4x length of prozona (Figs 316–322). A rare ZAMBIAN endemic..... *Tenuihippus* Willemse, 1994
- 4 Antennae shorter than combined length of head and pronotum, compressed in basal part and thickened in apical half; brachypterous. SOMALIA *Guichardippus* Dirsh, 1959
- Not as above; antennae of varying length and thickness, sometimes slightly compressed and widened basally, but not otherwise specialized 5
- 5 Rim of fastigium of vertex narrow and projecting, no trace of temporal foveolae. Fully winged 6
- Rim of fastigium of vertex thick, temporal foveolae present, though sometimes as little more than faint granular pits along or below the rim, or even obsolete (see Jago (1970) for an illustration) 7
- 6 Pronotal carinae in prozona straight, parallel, obliterate in metazona; costal and subcostal area of wing inflated at apex, medial and cubital area widened; lustrous with regular sparse transverse veinlets (Fig. 125). GUINEA, KENYA, TANZANIA, SOUTH AFRICA.....
..... *Comacris* I. Bolívar, 1890
- Lateral pronotal carinae distinct throughout, incurved in prozona, strongly divergent in metazona (Fig. 123); wing venation normal unspecialized. Widespread in W. Africa, also in CONGO REP., D.R. CONGO, and UGANDA *Chirista* Karsch, 1893
- 7 Tegmina and wings fully developed or shortened, but in dorsal position 8
- Tegmina lobiform, positioned laterally 11
- 8 Pronotum weakly sub-cylindrical; lateral carinae obliterate between first and second transverse sulci and almost so in metazona. Coloration usually as contrasting broad longitudinal dark and light bands (Fig. 323). W. Africa to ETHIOPIA, D.R. CONGO
..... *Zacompsa* Karsch, 1893
- Pronotum more or less tectiform or saddle-shaped, compressed in middle; lateral carinae distinct in metazona 9
- 9 Pronotum shortened, strongly compressed in middle; metazona much shorter than prozona; lateral carinae callose, interrupted by sulci and obliterate between first and second sulcus; brachypterous; arolia small (Figs 297, 299). KENYA, SOMALIA
..... *Brachybothrus* **gen. n.**
- Pronotum not strongly shortened and compressed; metazona as long as, slightly shorter than, or longer than prozona; arolia not unduly small 10
- 10 Fastigial foveolae weak, sometimes absent. Dorsum of pronotum flat; lateral carinae sharp and parallel to subparallel in prozona, more or less divergent, weak or obliterate in metazona; macropterous or brachypterous (but see also micropterous species under couplet 12). Widespread south of the Sahara.. *Coryphosima* Karsch, 1893
- Fastigial foveolae concealed from above, but usually distinct, shallow and elongate. Pronotum somewhat constricted in middle; pronotal carinae well developed; lateral carinae straight, or slightly or strongly incurved; tegmina and wings fully developed or shortened. Widespread south of Sahara *Gymnbothrus* I. Bolívar, 1889
- 11 Lateral pronotal carinae strongly, almost angularly incurved.....
..... *Gymnbothrus* (micropterous species)¹
- Lateral pronotal carinae moderately or weakly incurved, or straight and parallel in prozona and divergent in metazona 12
- 12 Pronotum subcylindrical, lateral carinae moderately and broadly incurved. ETHIOPIA, KENYA, UGANDA..... *Rastafaria* Ramme, 1931
- Pronotum weakly tectiform lateral carinae straight or only weakly incurved..... *Coryphosima* (micropterous species)¹

¹ See couplet 10 for macropterous and brachypterous forms.

Generic diagnosis

Roduniella I. Bolívar, 1914

Roduniella I. Bolívar, 1914: 84.

Type species.—*Duronia insipida* Karsch, 1896: 84, by original designation.

Description.—In key to genera and Figs 120–122. Epiphallus Fig. 122.

Species notes

Roduniella insipida (Karsch, 1896)

Figs 120–122

Duronia insipida Karsch, 1896.

Duronia duria Karsch, 1896 (syn. Uvarov 1938).

Duronia ituriensis Rehn, 1914 (syn. Uvarov 1953).

Roduniella ugandae Miller, 1932 (syn. Uvarov 1938).

Material.—Holotype female (*D. insipida*): UGANDA: Sesse Islands (MfN).

Description.—Integument smooth, matt. Antennae narrowly ensiform, flattened basally, as long as, or slightly longer than, combined length of head and pronotum. Frontal ridge narrow with thick margins, slightly expanded between antennae, shallowly sulcate and weakly expanded below medial ocellus (Fig. 120). Fastigium concave, triangular, with rounded apex and straight strong margins. Medial carinula weak to obsolescent; arcuate sulcus well behind middle (Fig. 121). Pronotum weakly tectiform with carinae distinct; lateral carinae parallel in prozona, weakly divergent in metazona; metazona as long as or slightly longer than prozona, its hind margin obtuse-angular. Coloration in shades of green, predominantly grass green, with brownish and yellowish patches and stripes (note dark blackish-brown lateral stripe extending from antennal pit across upper margin of lateral pronotal lobe and thorax but leaving a clear oblique stripe in middle of latter, then crossing medial and cubital areas of tegmina). Hind femur and tibia fawn/brown.

Measurements.—(In mm). Size small; total length: male 12–15, female 18–22.

Discussion.—Hygrotypic to mesohygrotypic, frequenting marshes and lake shores, usually in grasslands liable to flooding. Adults recorded throughout the year, thus probably breeding without marked interruption.

Distribution.—CAMEROON, UGANDA, KENYA, D.R. CONGO. In UGANDA recorded from: Entebbe, Kampala, Kazinga channel, Bwamba, Bugoma forest, Kakamiro, but also at altitude from Ruwenzori, at 4,500' (1370 m) and 8,000–9,000' (2438–2743 m), and Mount Elgon 5,000–7,000' (1850–2134 m).

Generic diagnosis

Chirista Karsch, 1893

Chirista Karsch, 1893: 54, 75.

Type species.—*Stenobothrus comptus* Walker, 1870: 762 (Sierra Leone), by subsequent designation I. Bolívar, 1909, note.

Description.—Recognition as in the key to genera.

Species notes

Chirista compta (Walker, 1870)

Figs 123, 124

Gymnobothrus varians Karsch, 1891 (Barombi) (syn. I. Bolívar 1909).

Chirista varians Karsch, 1893:76 (syn. I. Bolívar 1909).

Duronia virgula I. Bolívar, 1890 (Ashanti) (syn. I. Bolívar 1909).

Duronia pegasus Rehn, 1914 (D.R. CONGO) (syn. Uvarov 1953).

Description.—Moderately slender. Size (in mm): total length: males 14.5–17.0, females 18.0–21.0. Integument finely rugose and dotted. Antennae filiform, in males about as long as combined length of head and pronotum; in females somewhat shorter. Frontal ridge weakly sulcate, margins slightly divergent downwards. Fastigium of vertex moderately concave, narrowly parabolic with sharp margins; foveolae absent. Pronotum weakly selliform, median carina linear; lateral carinae more obtuse, strongly incurved in prozona, divergent in metazona. Latter with obtuse-angular hind margin and as long as, or slightly longer than, prozona (Fig. 123). Tegmina and wings fully developed, tegmina relatively narrow, intercalary vein weak or absent. Epiphallus with rather short lophi (Fig. 124). General coloration variable, particularly in females, in shades of green and/or brown, paler dorsally and ventrally; in brown individuals usually a dark brownish lateral stripe of varying width extending backwards from antennal pits across upper half of lateral pronotal lobes, but interrupted by a conspicuous oblique clear stripe on mesothorax; in green variants this band is narrowly confined to upper edge of lateral pronotal lobes. Darker blackish-brown color forms could be fire-melanic. Hind wings hyaline, or slightly infumate.

Distribution.—Widespread from western Africa to D.R. CONGO and ANGOLA, to UGANDA (Bwamba, Jinja, Mabira forest, Kampala, Lake George, Buruli, Samburu falls) and ETHIOPIA (Dembi Forest – Felix and Massa 2016). In Uganda one of the most common forest-edge species.

Generic diagnosis

Comacris I. Bolívar, 1890

Comacris I. Bolívar, 1890: 312.

Type species.—*Chrysochraon semicarinatus* Gerstaecker, 1869: 218, by subsequent designation (I. Bolívar 1909).

Description.—Recognition as in the key to genera. Venation of hind wings very distinctive (key to genera and Fig. 125); complete absence of fastigial foveolae is also diagnostic.

Species notes

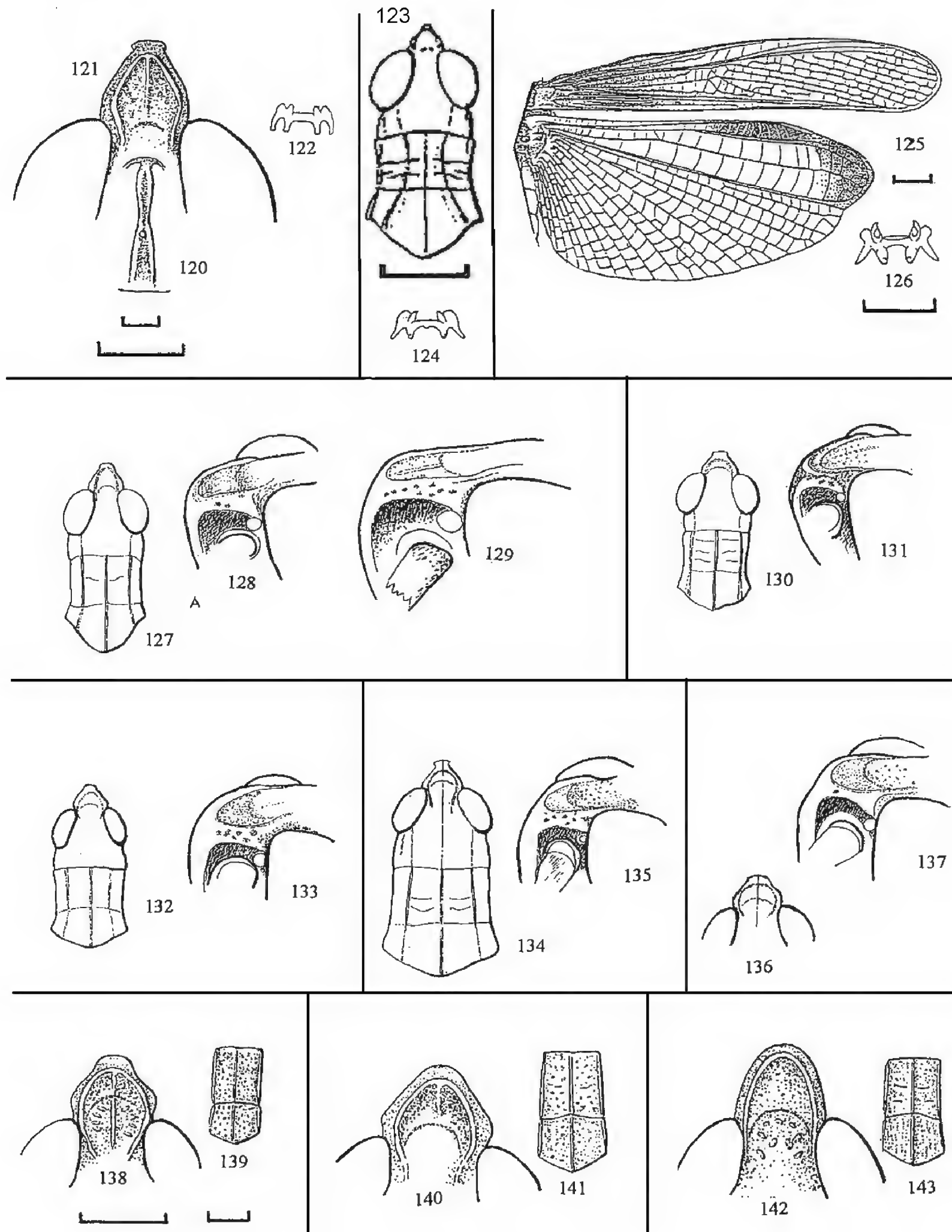
Comacris semicarinatus (Gerstaecker, 1869)

Figs 125, 126

Chrysochraon semicarinatus Gerstaecker, 1869: 218.

Comacris sansibaricus I. Bolívar, 1890: 313 (syn. Karsch 1900: 275).

Material.—Holotype male (*semicarinatus*): KENYA: Wanga (material not available); Types male and female *sansibaricus*: Zanzibar.



Figs 120–143. Tribe Gymnobothrini. **Figs 120–122.** *Roduniella insipida* male: 120. Frontal ridge; 121. Vertex from above; 122. Epiphallus. **Figs 123, 124.** *Chirista compta* male: 123. Head and pronotum from above; 124. Epiphallus (after Dirsh 1965). **Figs 125, 126.** *Comacris semicarinatus* male: 125. Fore and hindwings, note hind wing speculum; 126. Epiphallus. **Figs 127–129.** *Coryphosima* spp: 127–129. *C. stenoptera*: 127. Head and pronotum male from above; 128. Oblique view of vertex and weak foveolar pits; 129. Oblique view of vertex and stronger foveolar pits; 130–131. *C. brevicornis*: 130. Head and pronotum male from above; 131. Oblique view of vertex. 132–133. *C. stenoptera vicina*: 132. Head and pronotum male from above; 133. Oblique view of vertex. Note: now a synonym of *C. stenoptera stenoptera*. 134–135. *C. bintumana*: 134. Head and pronotum of male from above; 135. Oblique view of vertex. 136–137. *C. maliensis*: 136. Male vertex from above; 137. Oblique view of vertex. 138–139. *C. cytidonotus*: 138. Male vertex from above; 139. Pronotal disc. 140–141. *C. vumbaensis*: 140. Male vertex from above; 141. Pronotal disc. 142–143. *C. abyssinica*: 142. Male vertex from above; 143. Pronotal disc. All scale lines represent 1 mm: that under Fig. 126 applies to Figs 122, 124 and 126; that under Fig. 125 applies to Fig. 120 (lower fig.) and Fig. 125; that under Fig. 138 applies to Figs 121, 128, 129, 131, 133, 135, 137, 138, 140, 142; that under Fig. 139 applies to Figs 127, 130, 132, 134, 136, 139, 141 and 143. That under Fig. 123 applies to Fig. 123 only.

Other series: TANZANIA: Zanzibar: Korogwe, Dar-es-Salaam, Tanga, Miombo, Mlingano, Ngomeri; SOUTH AFRICA: Durban.

Description.—Size (in mm): Small; total length: male 16–17, female 22–24. Integument finely rugose, matt. Antennae rather thick, basally slightly compressed, in males somewhat longer than combined length of head and pronotum. Frontal ridge weakly sulcate, margins low weakly divergent. Pronotum weakly tectiform, almost flat; lateral carinae strong, straight and slightly divergent in prozona, obliterate in metazona. Metazona equal in length to prozona, its hind margin obtuse-angular. Tegmina extending beyond hind knees, rather broad; intercalary vein in medial area weak. Hind-wing venation specialized, costal and subcostal areas inflated at apex, medial and cubital areas strongly expanded, lustrous with regular, sparse, transverse veinlets (Fig. 125). Epiphallus with relatively short incurving lophi (Fig. 126). General coloration uniformly brownish to greenish-brown, probably a somewhat brighter green in life. Some specimens with a darker dorsal medial stripe. Hind knee dark. Frons, gena and ventral part of pronotal lobe white or cream colored.

Discussion.—*C. semicarinatus* is predominantly East African where it is best known from coastal grasslands. However, the type locality (Wanga) is in Western Kenya. The only other species, *C. lamottei*, is known only from Guinea, Mt. Nimba. It differs from the type species in its smaller size and shorter wings. Biology little known, but habitat apparently predominantly short moist grasslands. Adults in IV and VIII–XII.

Distribution.—Predominantly East African, but also reaches Kwazulu-Natal in South Africa. KENYA; TANZANIA; SOUTH AFRICA. Given this distribution, presence in MOZAMBIQUE seems probable.

Generic diagnosis

Coryphosima Karsch, 1893

Coryphosima Karsch, 1893: 54, 72.

Type species.—*Coryphosima brevicornis* Karsch, 1893: 72 (type female, TOGO: Bismarckburg) by original designation.

Paracomacris Karsch, 1900: 276 (syn. Dirsh 1958).

Description.—Recognition as in the key to genera. Genital structures characteristic of *Gymnobothrus* genus group, show little variation and are of little taxonomic use. Epiphallus (Fig. 25).

Discussion.—A large genus showing considerable taxonomic variation and, like other genera in the *Gymnobothrus* group, individual variation may be large even at a single locality. Some recent synonymy, however, is thought unjustified. Consequently, carefully defined criteria have been established here, enabling definition of species and subspecies to be made on a consistent basis: geographically distinct populations are considered as valid species if there are no intermediate forms, but in the presence of clinal links they are considered to be subspecies.

In addition to the principal characters used previously to diagnose taxa, this study has found that wing length and structure are informative in dividing these taxa into three groups: macropterous, brachypterous, and micropterous. These are treated sequentially below.

1) Macropterous group: Folded wings reach or extend beyond the tip of abdomen; this group contains several closely related taxa, with *Coryphosima stenoptera* (Schaum, 1853) (Fig. 127) as the most important element. This group has been subjected to a number of revisions, as follows:

- i) Uvarov (1953), in his preliminary review of the species and subspecies of *Paracomacris* Karsch, 1900, cited seven macropterous species and subspecies, with 12 synonyms. To size (i.e. body length, length of elytra, and hind femur) he added width of the costal and subcostal (scapular) area of the tegmen and the shape of the radial vein as of major diagnostic importance. These criteria divided his material into three species groups:
 - a) Scapular area narrow, radial vein straight: *P. centralis centralis*, *P. centralis planicola*, and *P. acuta*.
 - b) Scapular area broad, radial vein sinuous: *P. stenoptera stenoptera*, *P. st. montana*, *P. st. pharaonis*.
 - c) Scapular area and radial vein of intermediate width and shape: *P. producta*.
- ii) Dirsh (1966, 1970) stated that Uvarov's tegminal characters were, in his opinion, too variable to define species entities. He consequently published an extensive synonymy under *stenoptera*, as follows:

Coryphosima (= *Paracomacris*) *stenoptera* =

Chrysochraon stenopterus Schaum, 1853.

Stenobothrus productus Walker, 1870 (syn. Dirsh 1966).

Duronia tricarinata I. Bolívar, 1890 (syn. Uvarov 1953).

Coryphosima brevicornis Karsch, 1893 (syn. Dirsh 1966).

Paracomacris deceptor Karsch, 1900 (syn. Uvarov 1953).

Duronia pooensis I. Bolívar, 1905 (syn. Johnston 1956, Dirsh 1958).

Phlaeoba pharaonis Karny, 1907 (syn. Dirsh 1966).

Phlaeoba pharaonis var. *alterrima* Karny, 1907 (syn. Uvarov 1953).

Paracomacris stenoptera pharaonis (Karny, 1907) (syn. Uvarov 1953).

Paracomacris centralis Rehn, 1914 (syn. Dirsh 1966).

Rodunia pharaonis var. *virescens* Karny, 1915 (syn. Dirsh 1966).

Rodunia pharaonis var. *ferruginea* Karny, 1915 (syn. Dirsh 1966).

Duronia acuticeps I. Bolívar, 1915 (syn. Uvarov 1953).

Rodunia deceptor f. *kilimana* Sjöstedt, 1931 (syn. Uvarov 1953).

Paracomacris centralis planicola Uvarov, 1953 (syn. Dirsh 1966).

Paracomacris acuta Uvarov, 1953 (syn. Dirsh 1966).

- iii) Johnsen (1984) synonymized *C. vicina* (Dirsh, 1956) with *C. stenoptera* (Schaum, 1853).
- iv) Mestre (1988) rightly reinstated *Coryphosima brevicornis* Karsch, 1893 as a valid species.
- v) The present paper. Popov wrote: "In view of transitional forms, this study makes *C. vicina* (Dirsh, 1956) (macropterous; South Africa) a subspecies of *C. stenoptera*, as *C. stenoptera vicina* (Dirsh, 1956)".

Editorial note.—Popov seems to have been unaware of Johnsen's (1984) synonymy, but both authors follow the same rationale. We accept Johnsen's synonymy, considering it to be corroborated by Popov's opinions.

The macropterous group also includes: *Coryphosima stenoptera montana* (Uvarov, 1953) and *Coryphosima stenoptera colorata* **subsp. n.**, both from Ethiopia.

There are now, therefore, two macropterous species (*stenoptera* and *brevicornis*), the first of which has three subspecies.

Key to macropterous species and subspecies of *Coryphosima* in western and eastern Africa

- 1 Size relatively small, total length male 12–15 mm, female 16–20 mm, but robust; tegmina barely reaching tip of abdomen..... 2
- Larger and more slender, male 16–23 mm, female 20–28 mm, tegmina extending well beyond tip of abdomen 3
- 2 Fastigium of vertex very broad, transverse sulcus well forward (Fig. 131). Highlands of S.W. TOGO, S.E. GHANA, S. IVORY COAST, GUINEA: Mt. Nimba *brevicornis* Karsch, 1893
- Fastigium of vertex not unduly broad, arcuate sulcus behind the middle (as in Fig. 129). Highlands of ETHIOPIA *stenoptera montana* (Uvarov, 1953)
- 3 Coloration bright and contrasting, including shades of blue. ETHIOPIAN highlands *stenoptera colorata* subsp. n.
- Coloration in shades of brown and stramineous, dorsally often green. Widespread across western to eastern, central and southern Africa *stenoptera stenoptera* (Schaum, 1853)

2) Brachypterous group: Tegmina and wings strongly abbreviated; when folded, their apices falling well short of the tip of abdomen but overlapping dorsally. All brachypterous *Coryphosima* spp.—except one, the west African *C. maliensis* Descamps, 1965—are high altitude species, of limited vagility and localized distribution. The taxa are closely related and are probably the outcome of relatively recent speciation. Interspecific differences, although small, are fairly stable and are not indicators of trivial variability (*contra* Dirsh 1966).

The East African species are:

- Coryphosima elgonensis* (Uvarov, 1930)
 = *Paracomacris loveni* Sjöstedt, 1933a (syn. Uvarov 1938).
Coryphosima (= *Paracomacris*) *abyssinica* Uvarov, 1934 (syn. Dirsh 1966, now res. stat.).
Coryphosima vumbaensis (Miller, 1949).
Coryphosima cytidonota Jago, 1970.
Coryphosima danieli Massa, 2016.

The West African species are:

- Coryphosima maliensis* Descamps, 1965.
Coryphosima nimbana Chopard, 1958 (GUINEA, Mt. Nimba); syn. with *elgonensis* by Dirsh 1966 but restored by Mestre and Chiffaud 2006.
Coryphosima bintumana Roy, 1964 (SIERRA LEONE, Bintumani Mts.); also syn. with *elgonensis* by Dirsh 1966, but restored by Mestre and Chiffaud 2006.

Key to the brachypterous species and subspecies of *Coryphosima* in eastern Africa

- 1 Lateral pronotal carinae straight, parallel to sub-parallel (Fig. 139). Fastigium of vertex as in Fig. 138, arcuate sulcus near middle. N.W. TANZANIA *cytidonota* Jago, 1970
- Lateral pronotal carinae more divergent, especially in metazona. Arcuate sulcus of fastigium well behind the middle 2
- 2 Antennae thick and short, barely reaching hind margin of pronotum, or shorter; sculpturing coarse, metazona with parallel rugosities. UGANDA: Mt. Elgon *elgonensis* (Uvarov, 1930)
- Antennae longer and more slender, sculpturing finer 3
- 3 Fastigium of vertex about as wide as long (Fig. 140). ZIMBABWE: Vumba Mts *vumbaensis* (Miller, 1949)

- Fastigium of vertex distinctly longer than wide (Fig. 142) scapular field of tegmina narrow. ETHIOPIA: Jem-Jem and Chillalo; SOUTH SUDAN: Imatong Mts *abyssinica* (Uvarov, 1934)
- 4 Fastigium of vertex parabolic, prominent, 1.1 times longer than broad, its surface concave, margins smooth. Antennae nearly longer than head and pronotum together, the first 7–8 segments flattened, others rounded. Tegmina very short and wide (extending barely to 4th abdominal tergite). ETHIOPIA: Bale Mts *danieli* Massa, 2016

Key to the brachypterous species and subspecies of *Coryphosima* in western Africa

- 1 Of robust build, costal area of tegmina with a network of fine veinlets 2
- Of slender build, costal and subcostal area of tegmina with a network of thick, callose veinlets; lateral pronotal carinae weak (Fig. 134); foveolae of vertex as a row of fine dots (Fig. 135). SIERRA LEONE: Bintumani Mts *bintumana* Roy, 1964
- 2 Metazona and lateral lobes of pronotum strongly and callosely sculptured; size large (male 16 mm, female 25 mm). IVORY COAST, LIBERIA, GUINEA: Mt Nimba *nimbana* (Chopard, 1958)
- Sculpturing finer, temporal foveolae as in Fig. 137. S.W. MALI, Klela region to N. GHANA *maliensis* Descamps, 1965

3) Micropterous group: Tegmina and wings reduced to barely the length of pronotum, in lateral position, not overlapping dorsally. The three species placed in this group: *C. amplificata* (Johnston, 1937), *C. morotoensis* (Jago, 1968), and *C. triangularis* (Bouvy, 1982) are here all transferred from *Rastafaria* Ramme, 1931, where they were placed by Bouvy (1982). They differ substantially from the type species *R. abessinica* Ramme, 1931 in the structure of the fastigium, pronotum, genitalia and the type of coloration, in all these respects being much closer to *Coryphosima* and differing from the remaining taxa in that genus principally in a further reduction of the length of the organs of flight. This wing reduction in *Coryphosima* does not merit generic separation.

Key to the micropterous species and subspecies of *Coryphosima* in eastern Africa

The three micropterous species share a similar distinctive coloration, comprising contrasting broad longitudinal blackish-brown stripes on an ivory-white to fawn ground, which varies in detail between the species.

- 1 Dorsum pale fawn to cream without a medial dark stripe (Figs 145, 146) 2
- Dorsum with a black medial dorsal band extending from occiput to tip of abdomen. D.R. CONGO: Katanga Prov.; N.W. ZAMBIA *triangularis* (Bouvy, 1982)
- 2 Lateral pronotal carinae interrupted by typical sulcus only (Fig. 148) outer face of hind femora suffused with black. Mt. KENYA *amplificata* (Johnston, 1937)
- Lateral pronotal carinae interrupted by all three transverse sulci (Fig. 150); outer face of hind femur light brown, immaculate. UGANDA: Mt. Moroto *morotoensis* (Jago, 1968)

Species notes

1. Macropterous species

Coryphosima stenoptera stenoptera (Schaum, 1853)

Figs 127–129

Synonyms as above under *C. stenoptera*.

Material.—SENEGAL: Ziguinchor, Dieberine, Oussouye, Dakar. SIERRA LEONE: Mt. Aureol, Freetown, Kent, Bo Sewa beach, Kavi-na, Regent, Lumley beach; Gola. IVORY COAST: Man-Danané Road. LIBERIA: Bewi hills, Monrovia. MALI: Dogo, Kara. GHANA: Northern, Western and Eastern regions, many localities. TOGO: Pagala. NIGERIA: western province, Lagos, Ibadan. CAMEROON: Bamenda. SOUTH SUDAN: Imatong Mts. ETHIOPIA: Dessie area, 8000' (2440 m) (series provides a clinal link with *C. stenoptera montana*), Addis Ababa. SOMALIA: Tug Hodma E. of Karin, Bihendula, Nr. Berbern. UGANDA: Many localities including: Kampala, Entebbe, Bulemwezi, Lawero, Kapeka, Bugoma Forest, Kivuvu, Katangula, Butiaba, Kigezi, Acholi, W. Nile Dist., Tororo, Luwero, Bwamba, Mabira forest, Lango, Mbale, Bunioni-Kashenji, Terinyi, Katunguru. KENYA: Mt. KENYA (*Juniper/Podocarpus* forest), Aberdares 7000' (2130 m) (clinal link with *C. s. montana*), Thika 4,500' (1370 m), Kakamega forest, Narok, Masai Mara, Nyeri, Nairobi, Baringo, Turkana, Ngong, Kericho, Kapenguria, Kipleleo plain. ERITREA: Archico. TANZANIA: Tukuyu, Milepa plain, Malagarasi, Lake Rukwa, Kahama, Ngudu, Ngorongoro Rest House, Mkomasi Stn. 60 mi. W. Amani, Bugeno, Kakagwe, Mbulumbul, Muheza, Kilimanjaro, Victoria Nyanza, Ukerewe, Moyawosi, Namanye. Old Shinyanga, 10 mi. N. Ussure, Msigiri Road, Singida dist. (types of *Paracomacris centralis planicola* Uvarov, 1953—exceptionally large size: M 18–21 mm, F 25–28 mm). RWANDA: Kisenye. D.R. CONGO: Lake Albert: mouth of Semliki River, Kawa, Gety, Bogoro-Gety, Mahagi port, Bunia, Aru, Ratchuru, grass plain near Lake, Bambesa, Djugu Huri forest, Lubumbashi, Katanga: river Lubudi, Mt. Ruwenzori 6000' (1830m). ZAMBIA: Mwinilunga dist, Abercorn (Mbala), Mweru-wa-Ntipa, Konta plain, Musombwe, Lake Bangweulu, Kalungurishi, Lake Chila, Malagarasi. MOZAMBIQUE: Luabo, Beira, Salone forest, Zambesi: R. Sene Sugar Estate, Muccheve. ZIMBABWE: Salisbury distr. (Harare), Amandas, Silukut 4700' (1430m), Zimbabwe R, 4800' (1460m), Umtali Vumba, Umtali Xmas pass, Odzi dist. Mashonaland 5000' (1525m). ANGOLA: Moxico dist. Luena river, Lumeje river, Munhango river; Villa Luso, river Lungue Bangu, 9 mi. N.W. Sa. de Bandeira, 10 mi. N.E. Cacula, Santa Comba, Lubizi S.W. Alto Hama, Salazar, 10 mi. E. Gabela, Luimbale, Moxico dist: upper Luena river, river Lumeje, valley of Lotombwe, Busaco; Bihe dist: Cohemba, Luchase dist: river Quangu (types of *Paracomacris acuta* Uvarov, 1953 with exceptionally narrow, acute apex of the head). BOTSWANA: Moremi Res., Gazaland, Chirinda forest. SWAZILAND (now ESWATINI): Mbabane. SOUTH AFRICA: Transvaal (Gauteng): Johannesburg, Tzaneen; Louis Trichardt; Ngehele Zutpansberg distr.; Kwa-Zulu Natal: Royal National Park, Tugela valley (transitional *stenoptera-vicina* forms). *C. vicina* material; Zululand: Eshowe, Umfolosi dist. Hagana Hluhluwe 2000' (610 m), Mtubatuba; Pondoland, Ft. St John; Cape Prov. (Western and Eastern Cape): Eland Height, 15 mi. S.W. Mount Fletcher; Swellendam; Deepwalls Forest, Knysna dist. 1700' (520 m); Grahamstown; Aberdeen-Somerset East; Ketterberg; Wymberg Hili; LESOTHO: Mokhotlong.

Description.—As in key to genera and species. Size (in mm): Types of *Paracomacris centralis planicola* Uvarov, 1953 are of exceptionally large size, total length: males 18–21, females 25–28 - remaining material is in range: males 14–17, females 17–20. Antennae rather thick, cylindrical apically, slightly compressed but scarcely widened basally. Frontal ridge shallowly sulcate with obtuse lateral carinulae. Fastigium parabolic, shallowly concave, longer than wide, margins low and narrow, but distinct, medial carinula weak, or absent. Arcuate sulcus well behind middle (Figs 127, 128); fastigial rim thick, foveolae absent, or as weakly impressed small pits concealed from above (Fig. 129). Pronotal disc flat to weakly tectiform, median carina linear; lateral carinae straight and weakly divergent caudad, strong in prozona, weak and more or less obliterate in metazona; typical sulcus in mid position, interrupting medial and lateral carinae. First and second sulci weaker, not interrupting carinae (Fig. 127). Tegmina and wings fully developed, usually extending beyond hind knees; tegmina semi-transparent, rather narrow; intercalary vein of medial area present. Width of costal area and curvature of subcostal and radial veins variable. General coloration variable in shades of brown, from black/brown to stramineous, darker dorsally, paler ventrally; dorsum occasionally pigmented green especially in females. A dark blackish-brown lateral band is usually present, extending from post-ocular area across upper part of lateral pronotal lobes, to tegmina; a sulphurous stripe in basal part of radial veins is sometimes present. Wings hyaline to yellowish at base, infumate apically; hind knees dark brown-black, hind tibiae greyish-brown.

Discussion.—A fairly strict graminicole. Continuous reproduction with several annual generations.

Distribution.—Widespread in mesotypic and meso-hygrotypic savannas and grasslands from western to eastern, central and southern Africa. Recorded in all East African countries, often common. The now synonymized *C. vicina* (Dirsh, 1956) (syn. Johnsen 1983) extends the range of this subspecies to SOUTH AFRICA and LESOTHO (Figs 132, 133).

Coryphosima stenoptera montana (Uvarov, 1953)*Paracomacris stenoptera montana* Uvarov, 1953: 195.*Coryphosima stenoptera montana* (Uvarov, 1953) (syn. Dirsh 1958).

Material.—ETHIOPIA: Djem-Djem forest, 2400–3000 m; Mount Chillalo, 2400 m; Woroomon. Further material from Mt. Chillalo, moorland ca. 3000 m collected together with specimens of the brachypterous *C. abyssinica* Uvarov, 1934, but without any intermediate forms.

Description.—Differs from nominate subspecies in smaller size, but rather robust build and generally somewhat darker coloration. Fastigium of vertex elliptical. Pronotum short, rugulose; lateral carinae parallel. Subcostal area expanded with few widely spaced veinlets. Size (in mm): total length: males 13–15, females 18–21 mm.

Distribution.—ETHIOPIA. Clinal links between subspecies *montana* and *stenoptera* are apparent at lower altitudes on the Ethiopian plateau.

Coryphosima stenoptera colorata subsp. n.

Figs 151–153

Material.—Holotype male: ETHIOPIA: West of Mendi-Alendi-Asosa road, 1400 m. 17–20.IX.1976, Jago. All paratypes—5 males, 1 female, same data as holotype; female, West of Nejo, 2200 m 16–19.IX.1976, Jago (NHMUK).

Description.—Size close to nominate subspecies from lowland and mid altitude areas, males 17 mm, females 20–23 mm. General build slightly more slender, integument smoother, fastigium of vertex narrower (Fig. 152) and antennae longer (Fig. 153)—9 mm instead of average of 7 mm in male, but most striking difference is in coloration (discolored in dry specimens): in male antennae black; upper half of body in shades of brown, dorsum paler and upper sides of thorax dark chocolate-brown (Fig. 151) (contrasting with broad white stripe below which extends from gena to base of hind femur); abdomen with pale blue below in life; red undersides to hind femur and tibia with a ferruginous orange tinge; hind knee and adjacent part of tibia brownish-black, without a sub-basal pale ring. Hind wings hyaline, somewhat infumate apically. Coloration in females more subdued.

Discussion.—Habitat among long grass in shade adjacent to riverine woodland in marshy valley at 4,600 ft (1,400 m). Accompanied by *Amesotropis* spp., with *Oxya hyla*, *Rastafaria abessinica*, and *Orthochtha* spp. in adjacent swamp hollow.

Distribution.—ETHIOPIAN highlands.

Coryphosima brevicornis Karsch, 1893

Figs 130, 131

Coryphosima brevicornis Karsch, 1893: 64, fig. 5.

Description.—Diagnosis as in key. Of more stocky build and smaller size than *stenoptera*. Wings relatively short, barely reaching tip of abdomen. Uniquely broad fastigium of vertex with arcuate transverse sulcus located well forward (Figs 130, 131). Coloration in brighter and more contrasting shades of brown than in *C. s. stenoptera*, with a distinctive broad dark lateral stripe; outer face of hind femur dark yellow, knee black. Size (in mm). Total length: males 12–15, females 16–20.

Distribution.—Highlands of S.W. TOGO, S.E. GHANA, S. IVORY COAST, GUINEA (Mt. Nimba).

2. Brachypterous species.

Coryphosima cytidonota Jago, 1970

Figs 138, 139

Material.—Known only from type series. TANZANIA: Kasulu region, 24 km W. of Kasulu, 1500–2000 m, IX (NHMUK, ANSP).

Description.—As in key to species. Size smallest for genus; total length: males 11–12, females 15–17 mm. Antennae slightly flattened basally; in males rather longer than combined length of head and pronotum. Fastigium of vertex as in Fig. 138, arcuate sulcus near middle; anterior area smooth, posterior area coarsely callose; margins and medial carinula weak but distinct. Temporal foveolae absent. Pronotal disc as in Fig. 139, lateral carinae straight, almost

parallel and nearly complete in metazona. Metazona distinctly shorter than prozona, its hind margin obtuse angular. Tegmina vary in length from almost reaching supra-anal plate, to barely reaching posterior edge of fifth abdominal tergite; costal field surpassing middle of anterior border of tegmen. Hind femora relatively heavy. General coloration in shades of dark and lighter brown, with a contrasting black and creamy lateral stripe extending obliquely from base of antenna, across gena and lower part of lateral pronotal lobe. Dorsum of pronotum uniform brown, of light brown with medial carina narrowly edged with dark brown. Tegmina uniform brown. Hind femora pale brown, upper outer face and knee blackish; hind tibiae light brown, blackish towards extremities.

Distribution.—N.W. TANZANIA.

Coryphosima elgonensis (Uvarov, 1930)

Figs 154–157

Paracomacris elgonensis Uvarov, 1930: 249.*Paracomacris loveni* Sjöstedt, 1933 (syn. Uvarov 1938).

Material.—KENYA: Aberdares N. face, Chebuswa 00°14'S, 34°36'E, 3300 m; grassy ridge between dense *Erica* bush; 0°15'S, 36°35'E, 3380 m; moorland and heath zone at base of inselberg. Mt. KENYA 00°0'S, 37°18'E. UGANDA: Mt Elgon, alpine and heath zones at altitudes of 3000–4000 m on both the Ugandan and Kenyan sides. Adults I–III.

Description.—As in the key. Size slightly larger than preceding species (Fig. 154). Size (in mm): total length: males 13–16, females 16–20. Antennae somewhat shorter and incrassate. Fastigium of vertex as in Fig. 155, broadly parabolic, its rim thick; temporal foveolae present as small indentations (Fig. 156), arcuate sulcus well behind middle. Dorsum of pronotum (Fig. 157), lateral carinae straight, slightly divergent and weak in metazona. Costal area of tegmen expanded and extending beyond middle of tegmen. General coloration mottled brown, often with admixture of green. Dark lateral and often a dark medial dorsal stripe (Figs 154, 157) characteristic.

Distribution.—KENYA and UGANDA: Mt. Elgon. KENYA: Aberdares.

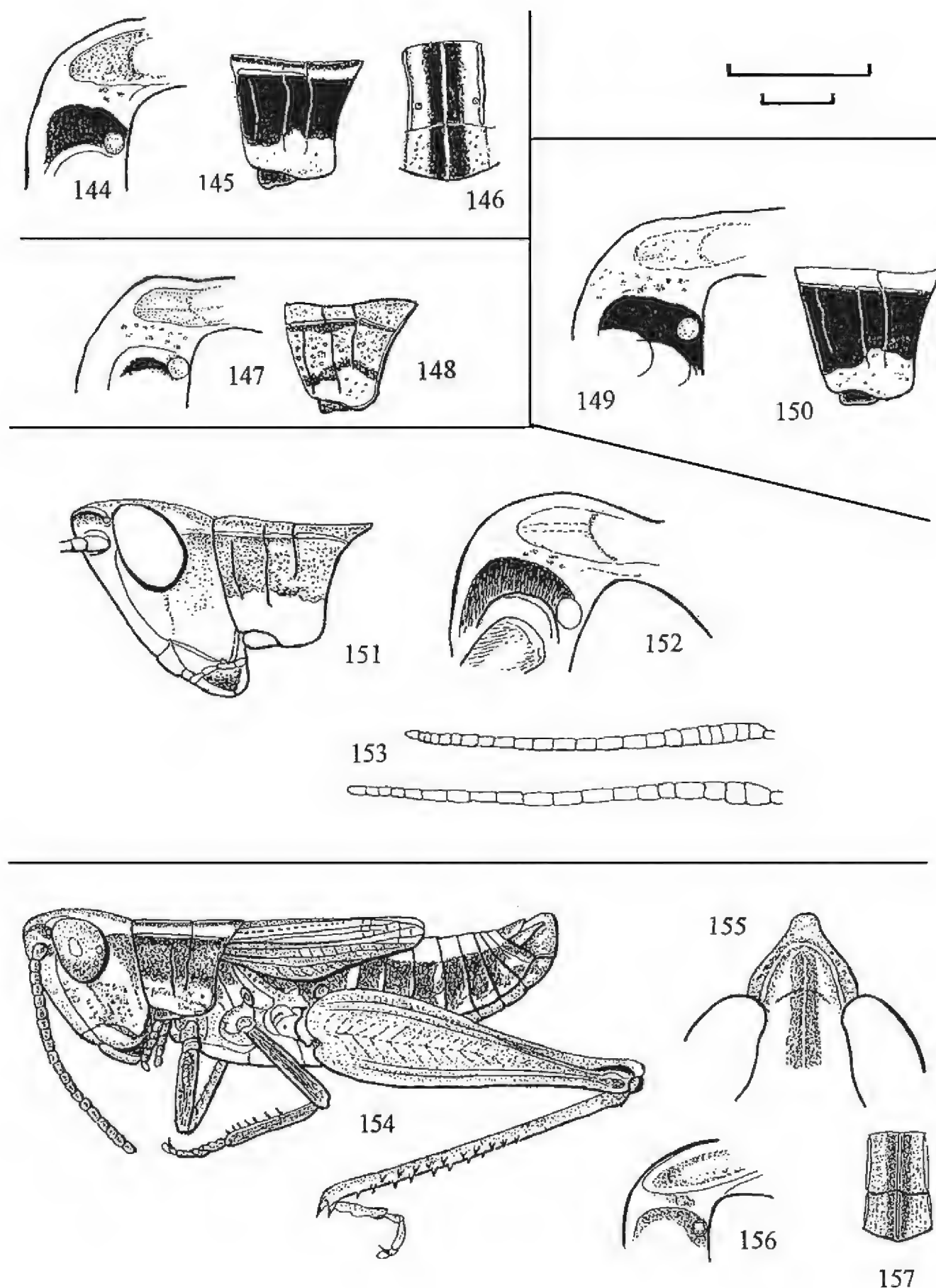
Coryphosima abyssinica (Uvarov, 1934), res. stat

Figs 142, 143

Paracomacris abyssinica Uvarov, 1934: 601.*Coryphosima abyssinica* (Uvarov, 1934) (syn. Dirsh 1958).

Material.—ETHIOPIA: Wouramboulchi, near Djem Djem, ca. 3000 m Arusi/Bale Prov. Shashamene-Goba road, 2610 m short turf/bush heath. Chillalo, moorland 3000 m SOUTH SUDAN: Imatong Mts.

Description.—As in the key. In size similar to, or slightly larger than, *C. elgonensis* but more slender. Antennae slender, exceeding length of head and pronotum in male. Fastigium of vertex (Fig. 142), parabolic, distinctly longer than wide. Pronotal disc (Fig. 143); metazona subequal in length to prozona, but proportionately longer than in other brachypterous species. General coloration mottled in shades of predominantly darker browns without admixture of green pigmentation; dark lateral band occurs predominantly in males.



Figs 144–157. Tribe Gymnbothrini. *Coryphosima* spp. Figs 144–146. *C. triangularis*: 144. Oblique view of vertex; 145. Lateral aspect pronotum; 146. Pronotal disc. Figs 147, 148. *C. amplificata*: 147. Oblique view vertex; 148. Lateral aspect pronotum; Figs 149, 150. *C. morotoensis*: 149. Oblique view vertex; 150. Lateral aspect pronotum. (see also Fig. 163). Figs 151–153. *C. stenoptera colorata* male: 151. Lateral aspect head and pronotum; 152. Oblique view of vertex; 153. Comparison of antennae in subsp. *stenoptera* (upper) and *colorata* (below). Figs 154–157. *C. elgonensis* male: 154. Lateral aspect whole insect; 155. Dorsal aspect vertex; 156. Oblique view of vertex; 157. Pronotal disc. All scale lines represented by 1 mm: Upper scale line applies to Figs 144, 147, 149, 152, 155, 156; lower scale applies to Figs 145, 146, 148, 150, 151, 153, 154, 157.

Discussion.—South Sudan series are darker, with a more deeply sulcate frontal ridge, and a smoother surface of fastigium of vertex than Ethiopian material. Subspecific status is, however, not warranted. Dirsh (1966) synonymized *abyssinica* with *elgonensis*, but this has been widely ignored by subsequent authors (Johnston 1968, Otte 1995, Cigliano et al. 2018) and it is here formally restored from synonymy.

Distribution.—ETHIOPIA, SOUTH SUDAN. Montane species, probably terri-graminicole. Adults X, XI and II.

***Coryphosima vumbaensis* (Miller, 1949)**

Figs 140, 141

Paracomacris vumbaensis Miller, 1949.

Material.—Known only from the type series. ZIMBABWE: Vumba Mts., 1520 m.

Description.—As in the key. Size and build similar to *C. abyssinica*. Fastigium of vertex broadly parabolic, as wide as long (Fig. 140).

Lateral pronotal carinae absolutely straight and evenly divergent caudad (Fig. 141); metazona subequal to prozona. Costal field of tegmen not surpassing middle of anterior border. Coloration in shades of brown, paler and less contrasting than in other species.

Distribution.—ZIMBABWE.

Coryphosima danieli Massa, 2016

Material.—Known only from the type series. ETHIOPIA: Bale Mts., 2380 m.

Description.—As in the key. A very small species, size (in mm): males 12.3–13.2, females 16.5–18.0. Antennae nearly longer than head and pronotum together, the first 7–8 segments flattened, others rounded. Foveolae absent. Face oblique, frontal ridge with parallel margins, except near the ocellus, where it is narrowed. Frontogenal carinae evident. Fastigium of vertex parabolic, prominent, 1.1x longer than broad, its surface concave, margins smooth. Pronotum disc slightly tectiform, with irregular longitudinal rugosities, central carina raised, interrupted only by typical sulcus, prozona just longer than metazona. Lateral carinae parallel, lower than central carina, broader and flattened in metazona. Anterior margin of pronotum nearly straight, posterior rounded. Lateral lobes as long as deep, their surface rugulose, lower margin little ascendant. Mesosternal space as long as wide, metasternal space much smaller, nearly square. Prozona slightly longer than metazona. For images, see Felix and Massa 2016, that is also the source of this description.

3. Micropterous species

Coryphosima amplificata (Johnston, 1937), res. stat. et comb. n.
Figs 147, 148

Paracomacris amplificata Johnston, 1937: 217–8, f. 1.

Coryphosima amplificata (Johnston, 1937) (syn. Dirsh 1956).

Gymnobothroides amplificata amplificata Jago, 1968: 1, 3, 11.

Rastafaria amplificata amplificata Bouvy, 1982: 430, f. 68, 69, 87.

Material.—Known only from type series. KENYA: Mt. Kenya, V, *Juniper-Podocarpus* zone (NHMUK).

Description.—Size slightly smaller than other species in group. Size (in mm): males 12–13, females 17.5–22.0. Antennae about 1.5x the length of head and pronotum, basal segments slightly flattened and expanded. Frontal ridge broad, shallowly concave with thick, nearly parallel margins. Fastigium of vertex (Fig. 147), carinulae and margins distinct; foveolae represented by shallow pitting. Pronotum (Fig. 148) weakly tectiform, lateral carinae distinct, subparallel in prozona, weakly divergent and partly obsolescent in metazona, interrupted by typical sulcus only. General coloration contrasting chestnut-black and cream; dorsum of pronotum cream, without dark marking; the dark band along the lateral lobes is weaker than in other species and is usually confined to narrow fasciae along the upper margin and below the middle of the lobe, the intervening area clear or with faint dark speckling. Discoidal area of tegmina with a black band and sometimes, more often in females, with a yellowish speculum. Abdomen with broad black lateral band attenuating apically. Outer face of hind femora suffused with black; lower face reddish, knees black.

Distribution.—KENYA: Mt. Kenya.

Coryphosima morotoensis (Jago, 1968), stat. n. et comb. n.
Figs 149, 150, 163

Gymnobothroides amplificata morotoensis Jago, 1968.

Rastafaria amplificata morotoensis Bouvy, 1982.

Material.—Known only from type series. UGANDA: Mt. Moroto, 3000 m, VIII 1966 (NHMUK).

Description.—Differs from *C. amplificata* in larger size. Size (in mm): total length males 15–17, females 20–29. Antennae 1.7x length of head plus pronotum. Fastigium of vertex (Fig. 149) somewhat broader, with weaker carinula; foveolae as weak or weaker. Pronotum with inflexed and markedly divergent lateral carinae interrupted by all three transverse sulci (Fig. 150). Epiphallus as in Fig. 163—compare with *Rastafaria*, Fig. 162. Coloration generally light brown and black; dorsum of pronotum without black, but side band strong, covering 2/3 of lateral lobe of pronotum (Fig. 150). Abdominal side band more interrupted and fainter; tegmina shiny-black in anterior 3/5; posterior femora light brown, immaculate. Females generally similar to males but antennae shorter, about equal to length of head and pronotum. Area of tegmen between C and Sc with a creamy calloused speculum in many specimens, thus unlike males.

Distribution.—UGANDA: Moroto Mt.

Coryphosima triangularis Bouvy, 1982 comb. n.
Figs 144–146

Rastafaria triangularis Bouvy, 1982.

Material.—D.R. CONGO: Katanga (as Shaba) Prov., Likasi (type locality), 10 mi. S. Kapona, 1570 m; Lubumbashi. ZAMBIA: N.W. Prov. Kapushi; Kipundu; 16 mi. N. of Mwinilunga (NHMUK).

Description.—Main diagnostic character is the triangular shape of the pyriform vesicle of the tympanum (Bouvy 1982).

Discussion.—Size and structural details species closely resembles *morotoensis* (compare Figs 144 and 149); separated by presence of a dark dorso-medial band which extends from occiput to tip of abdomen (Figs 145, 146).

Distribution.—D.R. CONGO, ZAMBIA.

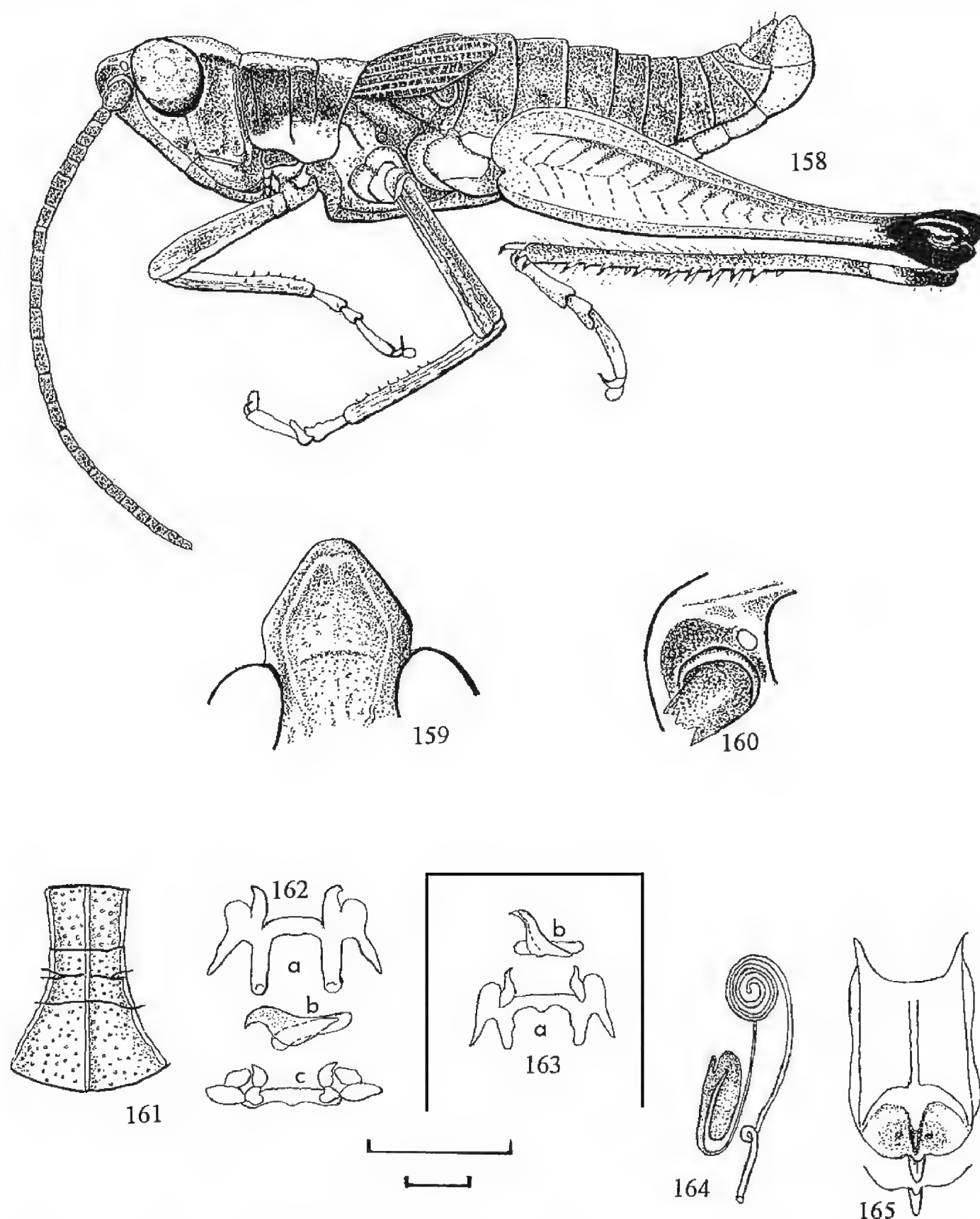
Generic diagnosis

Rastafaria Ramme, 1931

Rastafaria Ramme, 1931: 931, figs 8–18, pl. XI, fig. 9.

Type species.—*Rastafaria abessinica* Ramme, 1931: 932, by original designation.

Description.—As in the key to genera. Head pointed, somewhat inflated (Fig. 158); antennae almost twice combined length of head and pronotum in male, but only slightly longer in female. Frontal ridge rather thick, flat to weakly sulcate, markedly narrowed at junction with fastigium of vertex; latter excavate and elongate with arcuate sulcus well behind middle (Fig. 159). Pronotum sub-cylindrical, lateral carinae inflexed, weak to obsolete, but occasionally partly raised and callose, particularly in females; hind edge of pronotal disc



Figs 158–165. Tribe Gymnobothrini. Figs 158–162, 164–165. *Rastafaria abessinica*: 158. Whole male insect lateral aspect; 159. Dorsal aspect vertex; 160. Oblique view vertex; 161. Pronotal disc; 162. Epiphallus; 164. Female spermatheca; 165. Female sub-genital plate from above and its apex from below. Fig. 163. Epiphallus of *C. morotoensis*. All scales represent 1 mm: (upper) applies to Figs 159, 160, 162, 163; (lower) applies to Figs 158, 161, 164, 165.

broadly rounded to slightly emarginate (Fig. 161). Tegmina varying from slightly shorter to slightly longer than pronotal disc. Hind femora relatively slender. Male cerci elongate, tapering, but with rounded apices; supra-anal plate with medial groove extending half way to tip. Epiphallic lophi more elongate and robust than in most other members of group (Fig. 162; compare with Fig. 163). Coloration extremely variable, but characteristically with green and olivaceous pigmentation much in evidence. Female anatomy as in Figs 164, 165. Measurements (in mm); total length males 12–16, females 15–22.

Discussion.—In re-establishing *Rastafaria*, Bouvy (1982) considered that it included *R. abessinica* and three other taxa: *amplificata amplificata* (Johnston, 1937) and *amplificata morotoensis* Jago, 1968, transferred from *Gymnobothroides*, and *Rastafaria triangularis* Bouvy, 1982, described as new. Here *Rastafaria* becomes a monotypic genus again.

Species notes

Rastafaria abessinica Ramme, 1931

Figs 158–162, 164–165

Rastafaria abessinica Ramme, 1931: 931–2, 5 figs.

Gymnobothroides hypsophilia Jago, 1968 (Bouvy 1982).

Material.—ETHIOPIA: Kefa prov. W. of Jimma (Bellela forest), 2075 m; 16 km N.E. of Jimma (Badabuna forest); Walaga prov. 4 km N.E. of Nkemte; 6.4 km W. of Ghimbi; between Bambesi and Asosa; between Mendi and Bambesi; 33.6 km W. of Mendi; Shewa prov. 13.4 km W. of Hager Hiwot; Guder-Nkemte rd. W. of Mendi. UGANDA: Bugisu, Mt. Elgon, above Bumasi-fwa, Bumagabula (34°27'E 01°09'N), 2400 m. KENYA: Kericho (NHMUK).

Description.—As in generic key and description. A distinctive species recognizable especially from structure of its head and pronotum and its striking coloration. Structural and color variation is considerable not only between samples from different localities, but also in material from same locality, notably in a very long series of *G. hypsophila* from Mt. Elgon. Among these, the range of color variation is truly remarkable; in males general coloration is olivaceous green to green with black antennae with or without a lateral black stripe variously developed and coupled with fine dark speckling; underside of abdomen yellowish apically. Hind femora with knees black, remainder yellow and lower inner and outer areas more or less suffused with bright pink pigmentation. Hind tibiae dull greyish blue. Females exhibit an even greater range of color variation, some are even brighter green than males, with a rich suffusion of crimson on lower inner and outer areas of hind femur, while others are of predominantly brown pigmentation with a well-marked broad dark lateral stripe. Brown variants are more usual in Ethiopian populations, which also exhibit considerable differences from Ugandan ones, notably in shape of frontal ridge and pronotal disc. The single male specimen from Kericho, Kenya, is close to Ugandan series.

Distribution.—ETHIOPIA, UGANDA, and KENYA; habitats at medium to high altitude.

Generic diagnosis

Gymnbothrus I. Bolívar, 1889

Gymnbothrus I. Bolívar, 1889: 100.

Ogmothela Karsch, 1896 (syn. Uvarov 1953).

Pseudochirista I. Bolívar, 1909 (syn. Uvarov 1953).

Orthochirista Sjöstedt, 1933 (syn. Uvarov 1953).

Gymnbothroides Karny, 1915 **syn. n.**

Phloeochopardia Dirsh, 1958 **syn. n.**

Type species.—*Gymnbothrus linea alba* I. Bolívar 1889: 100, by original designation.

Description.—As in key to genera (p. 67). Size below medium, mostly small. Size (in mm); total length: males 11–20, females 16–30. Antennae filiform, occasionally incrassate, basal segments sometimes flattened, rarely weakly expanded; length variable from less than to sometimes considerably more than that of combined length of head and pronotum. Frons oblique, slightly excurved; frontal ridge mostly flat or weakly sulcate, fairly broad with obtuse lateral margins weakly diverging downwards; constriction at junction with fastigium of vertex mostly weak. Fastigium concave, parabolic or trapezoidal with well-developed carinulae and shallow, but usually distinct, transverse arcuate sulcus in varying positions. Fastigial rim thick, temporal foveolae narrow, shallow and rugose, concealed from above. Pronotum more or less constricted; medial carina strong; lateral carinae partly or completely developed and more or less incurved; of three transverse sulci crossing pronotal disc only posterior one interrupts medial carina, but the others may also cut lateral carinae; metazona as long as, longer than, or shorter than prozona, its hind margin obtuse-angular, broadly rounded and occasionally weakly emarginate. Tegmina and wings fully developed, shortened, or vestigial; reticulation of tegmina moderately dense, with intercalary vein of medial area usually present. Hind femora moderately slender; arolia moderately large.

External and internal genital structures characteristic for group, but shape of epiphallus may additionally be diagnostic. Coloration variable, even in sympatric populations speckled, marbled or striped patterns of cryptic hues and shades of grey, brown, stramineous, with some dark maculation; green pigmentation very rare, but various degrees of fire melanism common. Bright coloration (red, orange, ferruginous or yellow) of lower outer and/or inner face of hind femur in some of the species diagnostic.

Discussion.—*Gymnbothrus* is closely related to the other large genus *Coryphosima*, from which it differs principally in a greater diversity of structural characters (see above). *Gymnbothrus* was reviewed by Uvarov (1953), who provided an annotated list citing 22 African species, two of them with subspecies. Further changes in species composition were made by Dirsh (1966, 1970) and Jago (1968, 1970). Bouvy (1982) focussed upon *Gymnbothroides*, a genus separated from *Gymnbothrus* only on the basis of tegminal reduction (cf. Uvarov 1953, Jago 1968). However, in line with reasoning pursued in reviewing *Coryphosima* (see above), the present author considers *Gymnbothroides* to be members of *Gymnbothrus* which have undergone extreme forms of wing reduction. They are predominantly species of restricted, disjunct distribution in highland habitats, and some show close affinities with species in adjacent lowlands. For instance, *Gymnbothroides pullus* and *Gymnbothrus rimulatus* are so close morphologically (cf. Figs 247–258) that they are certainly congeneric. Here 21 species are considered valid; of these, the two Madagascan species *G. madacassus* Bruner and *G. variabilis* Bruner, plus two others (*G. oberthuri* I. Bolívar and *G. romeri* Karny), are omitted from this review because of lack of information. Some taxa are based on local variants or are clearly synonymic with valid ones.

Distribution.—Whole of Africa south of the Sahara.

Diagnosis of species groups

Species groups are divided into **macropterous** (with species sub-groupings keyed below), **brachypterous** and **micropterous** genera.

Key to species groups and sub-groups within the genus *Gymnbothrus*

Macropterous group: Apices of folded wings and tegmina reach or surpass tip of abdomen.

- 1 Pronotal constriction weak, disc relatively flat, lateral carinae straight and weakly divergent caudad, or parallel, more or less slightly inflexed in prozona and more divergent in metazona. All pronotal carinae interrupted by posterior transverse sulcus and lateral carinae by one other; costal area of tegmen often with a distinct whitish stripe *lineaalba* sub-group
- Pronotum more or less constricted, lateral carinae more or less distinct, roundly or angularly inflexed, interrupted by all three transverse sulci 2
- 2 Lateral carinae angularly convergent in an X pattern onto first sulcus, strongly defined *cruciatus-longicornis* sub-group
- Lateral carinae more or less regularly, roundly incurved and strongly, or often weakly, defined 3

- 3 Antennae slender, much longer than head and pronotum together; metazona longer than prozona; lower outer area of hind femur reddish-ferruginous*temporalis* sub-group
- Antennae thick and shorter than, or barely longer than, head and pronotum together; lower outer area of hind femur yellowish*anchietae* sub-group

Brachypterous group: Tegmina and wings abbreviated, reaching only the middle of abdomen, or somewhat shorter, but in dorsal position. Includes *G. rimulatus* Karsch and *G. bounites* Jago which have close affinities with the *cruciatus* and *anchietae* species groups respectively.

Micropterous group: Tegmina and wings vestigial in lateral position (= the former genus *Gymnbothroides* Karny).

Macropterous group: The *lineaalba* species sub-group

Discussion.—Includes two species: *G. lineaalba* I. Bolívar, 1889 (widespread; savanna and woodland savanna belts Africa south of the Sahara) and *G. carinatus* Uvarov, 1941 (South Africa).

Key to species in *lineaalba* species sub-group

- 1 Strongly raised pronotal carinae; lateral pronotal carinae cut by both third and first sulcus (Fig. 181). Epiphallus Fig. 182. SOUTH AFRICA*carinatus* Uvarov, 1941
- Pronotal carinae not strongly raised; lateral pronotal carinae cut by second and third sulcus (Figs 166, 168, 174). Epiphallus Figs 177, 178. Widespread south of Sahara*lineaalba* I. Bolívar, 1889

Species notes

Gymnbothrus lineaalba I. Bolívar, 1889

Figs 166–180

Gymnbothrus linea alba I. Bolívar, 1889.

Chortoicetes subparallelus Rehn, 1914 (syn. Dirsh 1970).

Chortoicetes albomarginatus Karny, 1915 (syn. Uvarov 1953).

Pseudochirista houyi Ramme, 1931 (syn. Uvarov 1953).

Orthochirista variegata Sjöstedt, 1931. **syn. n.** (Fig. 166A).

Orthochirista elgonensis Sjöstedt, 1931, **syn. n.**

Material.—GUINEA: Mamou (type locality of *Chortoicetes albomarginatus* Karny). Central African Republic: Pama Quelle, (type locality of *Pseudochirista houyi* Ramme). UGANDA: Entebbe; Kakumiro; Mubende; Lake Rudolf (now KENYA); Buddu Kakuto; Lwango Buddu; Bugwere; Kapeka; Masaka Lwango; Kalisizo; Lango; Kabwe; Ankole; Lubale-Lwentobo; Ankole Lwasamaire, Koki; Lake George; Kazinga Channel; Kibale; Tororo; Chiawante Lango. KENYA: Donyo Sabuk; Thika; Mombasa; Baringo; Masai Mara; Witu Forest Res. Maralal; Emali range S. of Sultan Hamud; Emsu dist. 00°41'S, 37°28'E; Chyulu hills S.E. end, 77 kms from Makutano; Taita hills. ETHIOPIA: Addis Ababa; Lake Zwai; Sire; Harrar; Lake Bishoftu. ZAMBIA: Chyanga; Chingola, Mbala, Ndola. D.R. CONGO: Bunia upland 4500'; Gety; Kasenyi. ANGOLA: 3 mi. N. Sta. Comba. SOUTH AFRICA: Free State, Witzeishoek, 6100' (1860 m); Kwa-Zulu Natal; Transvaal (Gauteng).

Description.—Relatively slender build; size medium to below medium for genus. Integument smooth, matte. Antennae thick, weakly flattened and dilated basally; as long as, to slightly longer than

head and pronotum in male, somewhat shorter in female. Antennae with conspicuous white annuli in life. Frontal ridge broad with low thick margins weakly divergent towards clypeus; fastigial constriction weak (Fig. 167). Fastigium of vertex oblong, weakly concave with low margins, longer than wide in male (Fig. 176), shorter in female; temporal foveolae narrowly elongate (Fig. 175). Pronotal disc broad, weakly tectiform, somewhat variable in shape as in Figs 168–174; lateral carinae straight and weakly divergent caudad, or parallel, more or less slightly inflexed in prozona and more divergent in metazona. Lateral carinae vary from weak to strong and callose; first transverse sulcus weak, second strong, cutting lateral carinae (Fig. 166). Wings extend beyond hind knees and in some specimens (notably from Uganda) are exceptionally long. Genital structures as in Figs 179–180. Coloration variable in shades of brown, stramineous, and grey; dorsum usually paler than sides; face sometimes speckled, bearing an oblique ochraceous stripe below ocellus; pronotal disc uniformly colored, or sometimes with narrow dark brown stripes bordering contrastingly pale medial carina; lateral pronotal lobes often with a broad dark stripe and a large yellowish spot below (Fig. 166). Costal area of tegmina often with a contrasting white stripe and medial area with a chain of alternating dark and light spots. Wings hyaline, slightly infumate apically. Hind femur with dark knee and three more or less distinct oblique stripes across upper face; lower outer face greyish, inner ochraceous. Hind tibia greyish, with pale sub-basal ring. Measurements (in mm): total length males 12.0–16.5, female 17.0–24.0.

Discussion.—Our material exhibited considerable structural and color variation. Much of this occurs within sympatric populations. On this basis *G. variegatus* (Sjöstedt) and *G. elgonensis* (Sjöstedt), are variants of *G. lineaalba* and become **new synonyms** of it. (cf. Fig. 166A vs. Figs 168–174).

Distribution.—SIERRA LEONE, GUINEA, GHANA, IVORY COAST, CAMEROON, UGANDA, KENYA, SOUTH SUDAN, TANZANIA, ANGOLA, ZAMBIA, ZIMBABWE, MALAWI, ETHIOPIA, LESOTHO, NAMIBIA, SOUTH AFRICA.

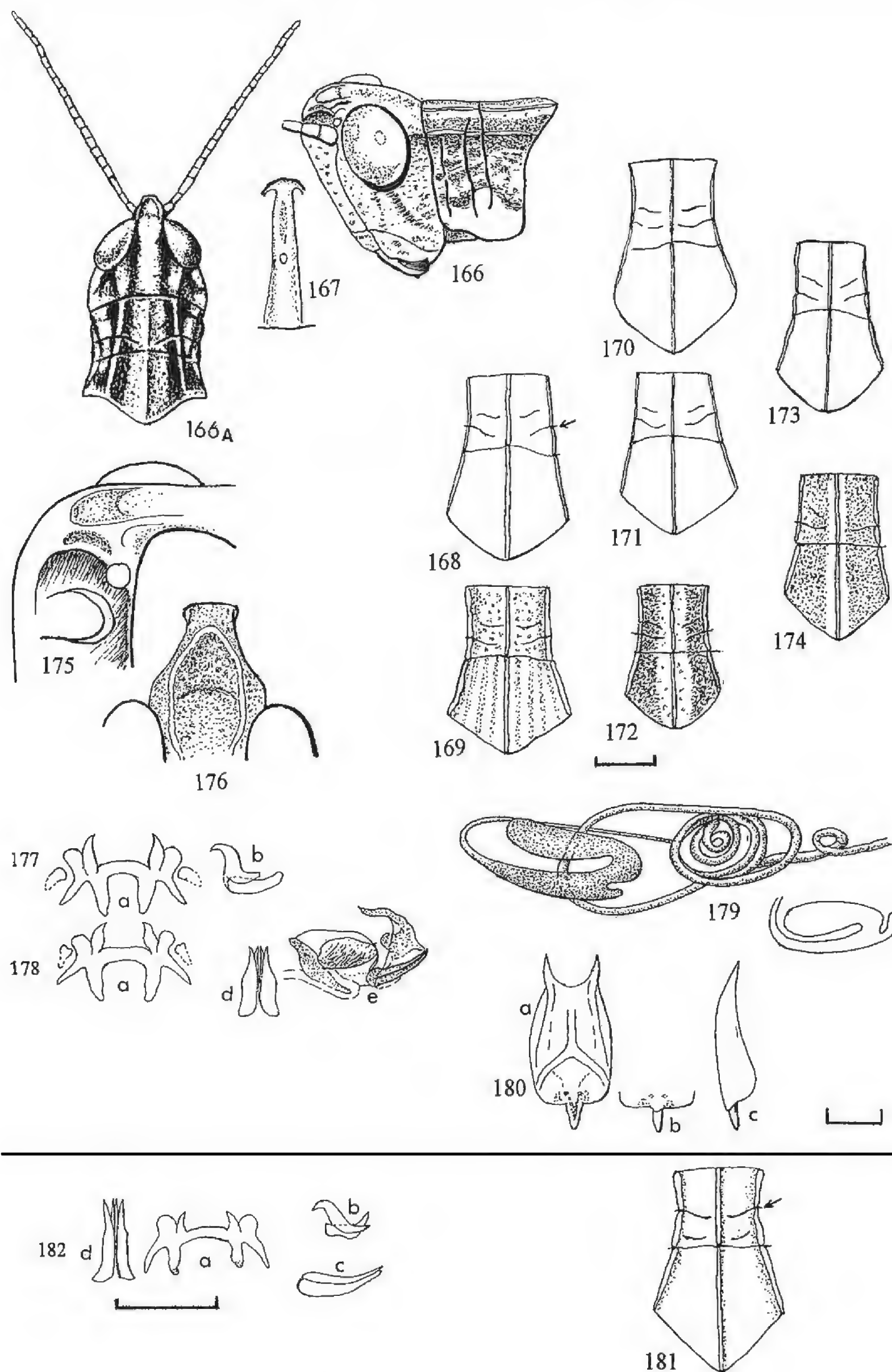
Gymnbothrus carinatus Uvarov, 1941

Figs 181, 182

Gymnbothrus carinatus Uvarov, 1941: 50.

Material.—SOUTH AFRICA: Western Cape (as Cape Province): Cape peninsula, Groote Schuur, Kirstenbosch; Constantia Nek; (Orange) Free State: Zostron; Kwa-Zulu Natal: Drakensberg. LESOTHO: Mokhotlong.

Description.—Slightly smaller but more robust than preceding species. Size (in mm); total length: males 14–15, females 17–18. Sculpturing of integument somewhat coarser. Antennae barely the length of head and pronotum, somewhat incrassate and flattened basally. Frontal ridge thick, sulcate below medial ocellus. Fastigium of vertex parabolic, considerably longer than wide; temporal foveolae kidney-shaped, deep. Pronotal disc rugulose (Fig. 181), medial carina strongly raised, acute; metazona longer than prozona, its hind margin forming a right angle with the tip rounded; lateral carinae well developed, weakly inflexed in prozona and interrupted by the first and the main transverse sulci. Epiphallus as in Fig. 182. Coloration similar to *lineaalba* except for the unusual occurrence of females with dark-green dorsum, not known in other species of the genus. Upper face of hind femur immacu-



Figs 166–182. Tribe Gymnobothrini. **Figs 166–180.** *Gymnobothrus lineaalba*: 166A. *Orthochirista variegata* Sjöstedt (n. syn. of *Gymnobothrus lineaalba*), reproduced from Sjöstedt (1931). 166. Oblique view head and pronotum; 167. Frontal ridge; 168–174. Variation in pronotal disc; 175. Oblique view vertex; 176. Dorsal view vertex; 177, 178. Variation in phallic structures; 179. Female spermatheca; 180. Female subgenital plate A. Dorsally and its apex B. Ventrally and C. Laterally. **Figs 181, 182.** *Gymnobothrus carinatus*: 181. Male pronotal disc; 182. Epiphallus and aedeagal valves. Scale lines all represent 1 mm: bottom left scale under Fig. 182 applies to Figs 175–179, 182; scale under Fig. 172 applies to all the rest.

late brown; lower outer face yellowish; inner face and tibia light brownish. Both light and fire melanic forms occur.

Distribution.—SOUTH AFRICA.

Macropterous group: The *cruciatus-longicornis* species sub-group

Description.—All possess a pronotal disc with a distinctive X pattern of more or less straight, angularly convergent lateral pronotal carinae.

Discussion.—Includes two species: *Gymnbothrus longicornis* (Ramme, 1931) and *Gymnbothrus cruciatus* I. Bolívar, 1889.

Key to species in *cruciatus-longicornis* species sub-group

- 1 Antennae slender and much longer than combined length of head and pronotum even in females; frontal ridge with a marked constriction at its junction with fastigium of vertex (Fig. 189). Lateral pronotal carinae mostly weak and obliterated between first and second transverse sulci; hind femur with distinctive dark pattern (Fig. 191).
.....*Gymnbothrus longicornis* (Ramme, 1931)
- Antennae only slightly longer than or same length as head and pronotum; frontal ridge only weakly constricted at its junction with vertex (as in Fig. 190). Lateral pronotal carinae mostly strong and not obliterated between first and second sulci. Hind femur mostly immaculate or with a short blackish stripe in middle of upper external area (Fig. 192).....*Gymnbothrus cruciatus* I. Bolívar, 1889

Species notes

Gymnbothrus longicornis (Ramme, 1931)
Figs 183–192

Pseudochirista longicornis Ramme, 1931: 921, 927, pl.11, fig. 1.
(Transferred to *Gymnbothrus* by Uvarov 1953: 122).

Material.—Holotype male *longicornis*: CENTRAL AFRICAN REPUBLIC: Bosum, Sanga-Lobadje.

Description.—As defined in the key above.

Discussion.—The various subspecies in this complex include several closely related taxa which are distributed across western Africa to East Africa and south to ANGOLA. In view of their close similarity and occurrence of clinal links between these species, they are here reduced to the level of subspecies under *longicornis* Ramme. It is conceivable, however, that two other extant taxa, *oberthuri* I. Bolívar, 1890 and *romeri* (Karny, 1909), from Tabora and Amani in TANZANIA respectively (not reviewed here as no material was available), could also belong to this group and thus in due course take precedence as older synonyms of *longicornis*.

Gymnbothrus longicornis ephippinotus Jago, 1966, stat. n. et comb.

Gymnbothrus ephippinotus Jago, 1966: 1949–1951, figs 18–25.

Material.—GHANA: Northern Region, Masaka, Tamale rd; Bulkwere; Bole; Yeji; Cambogu Upper reg.: Han; Tamu; N. of Nakpan-

duri, Gambaga scarp; Volta reg: 2ml.W of Kpandu; Ashanti reg: Jema; Keti Krachi. BURKINA FASO: 2 mi. N.E. of Kantchari. NIGERIA: Bida; Oyo; Kanije; Shagunu; Onigbu; Akwanga; Matyoro Lakes, 25 mi. N. Gombe.

Description.—General coloration dark blackish and brown markings against lighter background, often with dorso-medial cream stripe. Lateral pronotal lobes lighter ventrally. Tegmina with a series of 5–6 dark spots in medial area. Male abdomen reddish ventrally at maturity. Coloration of hind femora: upper area with 3 dark blackish spots extending as paler broad diffuse markings onto outer area; lower outer area with brownish-black stripe; inner area yellowish to blackish. Hind tibiae bluish-grey with black pigment basally, distally and ventrally. Measurements in Table 8.

Discussion.—Similar to nominate subspecies from CAMEROON, differing from it principally in more concave fastigium of vertex and more intensive black pigmentation, particularly of hind femora.

Distribution.—Guinea savanna of GHANA, BURKINA FASO, NIGERIA, and probably adjacent countries of western Africa. Adults in II, III, IV, V, VII, XII.

Gymnbothrus longicornis longicornis (Ramme, 1931), stat. n.
Figs 183–192

Pseudochirista longicornis Ramme, 1931: 925, 927, pl. 11, fig. 1.

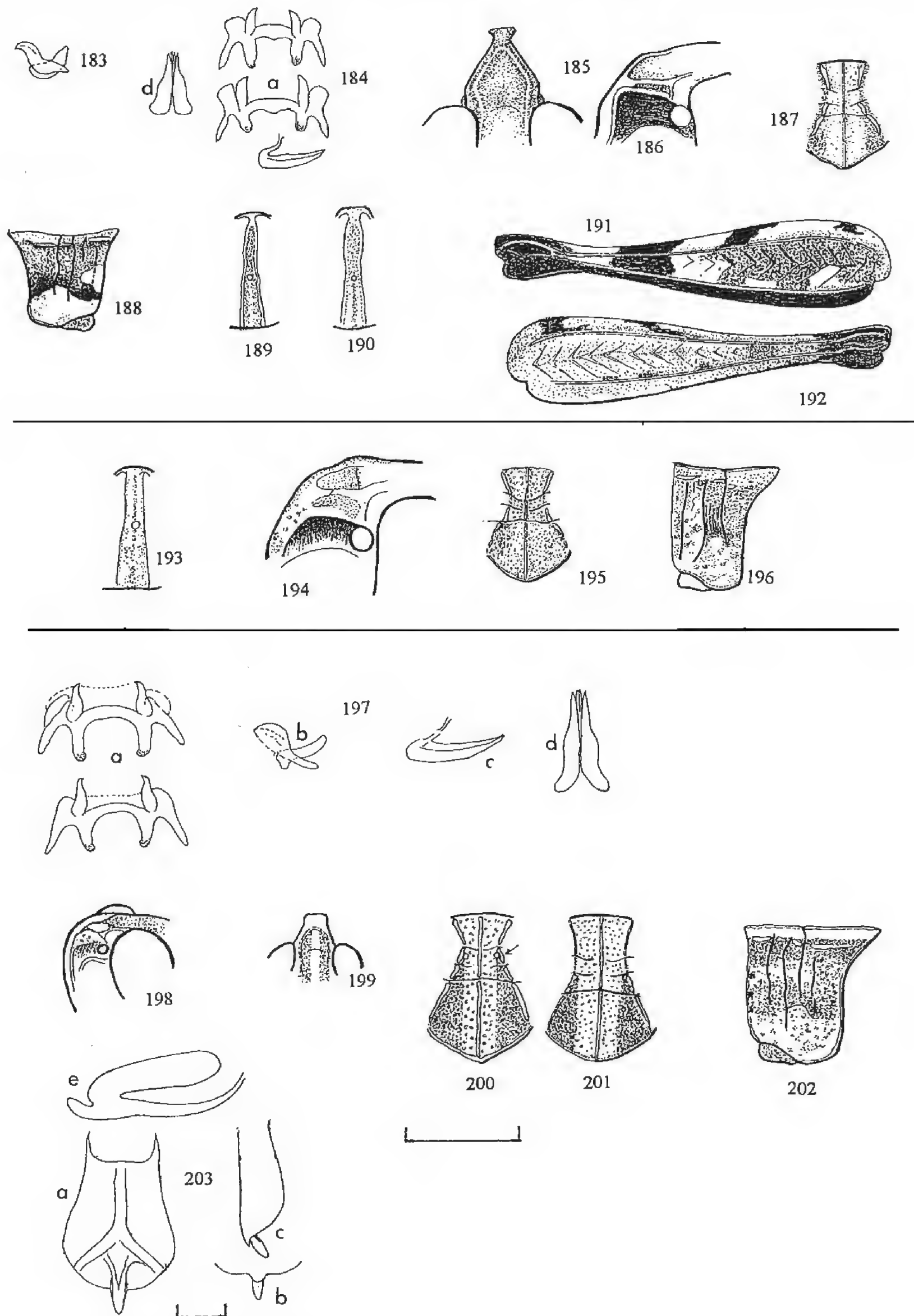
Material.—UGANDA: Koki; Lango district; Chiawanto; Adechal; Lake Albert, Butiaba; Fort Portal; Bundebugyo. TANZANIA: Mk-wemi, 22 mi. W. of Kahama; Morogoro; Mpwapwa, Mt. Kibabiani; 28 mi. N. Biharamulo.

Description.—In size and general build similar to subsp. *ephippinotus*. Size (in mm): total length: males 14.0–19.0, females 16.5–22.0. Antenna about 1.5x length of head and pronotum, its medial segment about 3 times longer than wide. Frontal ridge (Figs 189, 190), with fairly sharp margins, narrowly constricted apically, its surface pitted and shallowly sulcate. Fastigium of vertex less elongate and concave than in *ephippinotus*; foveolae narrow and deeply sulcate. Pronotum as in *ephippinotus*, but lateral carinae slightly stronger. Coloration in lighter shades than in *ephippinotus*, more uniform and less speckled. Dorsum is generally paler than sides; abdomen and underside fawnish; dark pattern on lateral pronotal lobes (Fig. 188). Pattern on outer face of hind femur as in Fig. 191; lower inner and outer face blackish brown.

Discussion.—The original paratype from Cameroon shows close similarity to the material from the Imatong area of South Sudan and from Uganda. In these, the fastigium of vertex is more broadly rounded, frontal ridge less sulcate, and lateral pronotal carinae stronger. Coloration of the Imatong specimens is also fairly simi-

Table 8. Morphometric measurements of *Gymnbothrus longicomis ephippinotus*.

	M (mm)	F (mm)
Antenna/length of head plus pronotum ratio	1.5	1.5
Tegminal length	16–19	17.5–21.5
Hind femur length	10–12	12–14
Total length	15–20	17–23



Figs 183–203. Tribe Gymnobothrini. **Figs 183–192.** *Gymnobothrus longicornis*: 183, 184. Variation in epiphallus and aedeagal valves; 185. Dorsal view male vertex; 186. Oblique view male vertex; 187. Male pronotal disc; 188. Lateral view pronotum; 189. Frontal ridge (C.A.R., Bosum); 190. Frontal ridge (Tanzania, nr Kahama); 191. Posterior femur, pattern on outer side (Cameroon); 192. Ditto, Tanzania. **Figs 193–196.** *Gymnobothrus longicornis sellatus* male: 193. Frontal ridge; 194. Oblique view vertex; 195. Pronotal disc; 196. Lateral aspect pronotum. **Figs 197–203.** *Gymnobothrus cruciatus* male: 197. Epiphallus and aedeagal valves; 198. Oblique view vertex; 199. Dorsal view vertex; 200. Pronotal disc (Tanzania syntype *elongata*); 201, 202. Lateral aspect pronotum (Tanzania and Angola, Villa Luso holotype *cruciatus* s.str.); 203. Female: E. Spermatheca and A–C. Aspects of subgenital plate. All scales 1 mm: that under Fig. 200 applies to Figs 183–186, 194, 197–199; that under Fig. 203 applies to Figs 187–193, 195, 196, 200–203.

lar: pronotal disc mostly pale, but occasionally edged with dark brown; lateral dark fascia is strong, covering upper 2/3 of pronotal lobes, but with a contrasting large cream spot along its anterior edge. Abdomen orange with a chain of intricate spots along tergites; series of spots on tegmina is faint and outer face of hind femur has a large pale spot, while upper face bears 3 alternating dark and pale spots; sub-basal pale spot is particularly vivid and contrasting in melanic forms. Lower outer face is brown and inner yellow. Hind tibia greyish brown with a broad pale sub-basal ring.

In Ugandan material antennae are equally long and slender, scarcely dilated basally; frontal ridge narrow, deeply sulcate at the ocellus, less so above and below; fastigium of vertex more parabolic; temporal foveolae narrow or broader, deeper below edge of rim, incompletely marginate below. Lateral pronotal carinae somewhat stronger and prozona subequal in length to metazona. Coloration in contrasting patterns of browns and pale cream; face a triangular mask of brown edged with cream; dark lateral fascia broad, paler in middle, its pattern on lateral pronotal lobes as in Fig. 188. Dark pattern on outer face of hind femur as oblique faint stripes, lower outer face dark brown, inner yellow.

In Tanzanian specimens (Mkwemi, Kahama) antennae are long, slender, and completely black; ratio to length of head and pronotum, 1.5 in male. Frontal ridge pitted and somewhat sulcate at ocellus, but fastigial constriction less marked (Fig. 190). Temporal foveolae consist of multiple shallow pits. Lateral pronotal carinae rather weak. Coloration is distinctive, predominantly in contrasting deep dark brown and cream; usually a pale dorso-medial stripe edged with dark brown present; face a mask of lighter brown triangle bordered with cream; pattern of lateral pronotal lobes brown, ochre and cream; abdomen is ferruginous with brown speckling; black pattern on hind femur confined to three spots on upper face and hind knee, but outer face slate-grey and brown, with lower outer face orange and inner face yellow (Fig. 192). Specimens from Morogoro are darker, have shorter antennae and a broader frontal ridge.

Distribution.—CAMEROON, CENTRAL AFRICAN REPUBLIC, SOUTH SUDAN, UGANDA, TANZANIA.

Gymnbothrus longicornis sellatus (Uvarov, 1953),
stat. n. et comb. n.
Figs 193–196

Gymnbothrus sellatus Uvarov, 1953.

Material.—ANGOLA: Moxico dist. rivers Lumeje; Munhango, Lungue Bungu, Mu-Simoi; Bihe dist. Cohemba. Also, Tundavala; Bruco; 15 mi. N. Sa de Bandeira; River Langiliko.

Description.—Size (in mm): males 16–19, females 18–21. Similar to other subspp. in size, general appearance, and elongate antennae; differs in following respects: Frontal ridge broadly sulcate from above ocellus downwards, flat and punctured elsewhere, its fastigial constriction weak (Fig. 193). Fastigium of vertex strongly concave, pentagonal, about as long as broad; temporal foveolae fairly large, incompletely marginated below (Fig. 194). Pronotum markedly more constricted ('sellate') than in other subspecies; lateral carinae obliterated between first and second sulci and in posterior 2/3 of metazona, strongly callose elsewhere (Fig. 195). Lateral pronotal lobes much deeper than long, their surface very uneven (Fig. 196). Coloration brown, mottled with ivory-white, buff, and grey; lateral pronotal lobes with typical pattern brown

above, ivory-white below. Tegmina grey with a series of brownish spots along discoidal field and beyond it. Abdomen reddish-brown below; upper face of hind femur with large brownish-black spots, outer face brown above, yellow below, while lower outer area brown. Hind tibia yellowish touched with black on inner and outer face.

Discussion.—The specimens from Bruco are less sellate and coriaceous and more like those from Tanzania.

Distribution.—ANGOLA. Adults recorded in VI, VIII, IX, X.

Gymnbothrus cruciatus I. Bolívar, 1889
Figs 197–203

Gymnbothrus cruciatus I. Bolívar, 1889: 101.

Chortoicetes fallax Karny, 1907 (syn. Dirsh 1966).

Pseudochirista fallax elongata Miller, 1925 (syn. Dirsh 1966).

Pseudochirista meruensis Sjöstedt, 1929 (syn. Uvarov 1953).

Material.—TANZANIA: Tukuyu vii.1923, N. C. E. Miller (Holotype male and 7 males, 11 female paratypes (some IX.1924) of *Pseudochirista fallax elongata* Miller); Morogoro; Mpwapwa, Mt. Wilkins 6000' (1830 m); Mkwemi 22 mi. W. Kahama; 60 mi. W. Amani; 6 mi. W. Kibau; 8 mi. S. Chala Mission. UGANDA: Lake George; Kigezi, Kashonji 7000' (2135 m). SOMALIA: Haud. D.R. CONGO: Lake Edward; Kasenyi. ANGOLA: Villa Luso 3000' (915 m), 7.VI.1927, M. Burr (labelled by Uvarov as homotypic with cotype of *G. cruciatus* I. Bolívar). KENYA: Turkana. ZAMBIA: Kabundi forest at Chingola (Johnsen 1984).

Description.—Closely similar to *G. longicornis*; similar but of more variable size and of more robust build. Size (in mm): total length males 13–18, females 17–23. Antennae usually thin, barely longer than head and pronotum in male, shorter in female. Frontal ridge broad, narrowly sulcate at medial ocellus, flat or convex elsewhere; margins low and thick, only weakly divergent towards clypeus and constricted at junction with fastigium. Fastigium parabolic; arcuate sulcus near mid position (Fig. 199). Foveolae mostly weak, elongate and narrow, or as series of shallow pits (Fig. 198). Pronotum of rather variable structure; carinae straighter than in *longicornis* and mostly strong and callose throughout, even between first and second sulci, but becoming obsolete towards rear margin of metazona. Latter longer than prozona and more broadly expanded than in *longicornis* (Figs 200–202). Epiphallus as in Fig. 197; spermatheca as in Fig. 203.

General coloration brownish, mottled and striped; face often with several alternating horizontal dark and light stripes; occiput and pronotal disc with a pale dorso-medial stripe edged with dark-brown lateral stripes, contrasting with callose ivory-white lateral carinae. Lower posterior part of lateral pronotal lobes with large ochraceous spot; abdomen light brown; tegmina with series of blackish spots in medial area; hind femur uniformly brown, sometimes with a small blackish stripe in middle of upper external area; lower areas brownish or yellowish. Hind tibia brownish with a pale sub-basal ring.

Discussion.—There is considerable structural, size, and color variation, with some specimens, for instance those from Mt. Wilkins in Tanzania (NHMUK collection), being fairly distinct from others. Subspecies status for them does not, however, seem justified at present. The types of *Pseudochirista fallax elongata* Miller were ex-

aminated and are considered conspecific with a specimen of *Chortoi-cetes fallax* Karny bearing that author's name label. A specimen of *G. cruciatus* I. Bolívar (det. Uvarov) is also a close match with neo-type material of I. Bolívar; this confirms the synonymy proposed by Dirsh (1966, 1970), and which is therefore adopted here.

Distribution.—KENYA, TANZANIA, UGANDA, SOMALIA, D.R. CONGO, ANGOLA, ZAMBIA.

Macropterous group: The *temporalis* species sub-group

Discussion.—This group includes the two closely related species: *Gymnbothrus temporalis* (Stål, 1876) and *Gymnbothrus flexuosus* (Schulthess, 1898). The latter was established by Kevan (1950) as a subspecies of the former, but in view of the marked morphological and color differences and their broadly sympatric distribution, which is indicative of an ecological rather than geographical distinction, the two taxa are here re-established as distinct species.

Key to species in *temporalis* species sub-group (Figs 204–224)

- 1 Tegmina extend well beyond the hind knees. Pronotal metazona considerably longer than prozona (Figs 205, 209). Hind femur without distinct dark bands along upper face; lower faces in shades of ferruginous-reddish *G. temporalis* (Stål, 1876)
- Apices of folded tegmina only just reach hind knees of posterior femora. Pronotal metazona only slightly longer than prozona (Figs 213, 217, 221). Hind femur with distinct dark bands on upper face; lower faces in shades of yellow-ochraceous *G. flexuosus* (Schulthess, 1898)

Species notes

Gymnbothrus temporalis (Stål, 1876)²

Figs 204–212

Epacromia temporalis Stål, 1876: 49, type female, NAMIBIA: Ovambo (NR, Stockholm)

Chirista virgata Karsch, 1893 (syn. Uvarov 1926), type female, TOGO (MfN)

Chirista flavolineata Karsch, 1893 (syn. Uvarov 1926), type male (MfN)

Chirista manca Karsch, 1893, types male, female (MfN) (syn. Uvarov 1926)

Chirista interrupta Karsch, 1896, female, TANZANIA: Zanzibar (syn. Sjöstedt 1909)

Chirista lacustris Rehn, 1914, female, D.R. CONGO (MfN) (syn. Uvarov 1926)

Chirista emini Rehn, 1914, female, D.R. CONGO, L. Albert (MfN) (syn. Dirsh 1970)

Zacompsa temporalis Uvarov, 1926 (syn. Uvarov 1953)

Pseudochirista temporalis fasciata Sjöstedt, 1931, types male, female, CONGO: Musana (NRM Stockholm) (syn. Uvarov 1953)

Material.—Series examined from: SENEGAL, GUINEA BISSAU, MALI, GUINEA, LIBERIA, SIERRA LEONE, TOGO, BENIN, IVORY COAST, GHANA, NIGERIA, CHAD, CAMEROON, ETHIOPIA, SOMALIA, SOUTH SUDAN, UGANDA, KENYA, TANZANIA, CONGO, D.R. CONGO, RWANDA, MALAWI, ZAMBIA, ZIMBA-

BWE, NAMIBIA, MOZAMBIQUE, BOTSWANA, SOUTH AFRICA (former Transvaal, Natal, Orange Free State, Cape Province).

Description.—Medium to larger size for genus; medium build. Size (in mm): total length males 15–19, females: 21–28. Integument finely rugulose and pitted. Antennae in male somewhat longer than, in female slightly shorter than head and pronotum. Frontal ridge broad, weakly sulcate at and below ocellus, flat to convex above with thick margins; only weakly constricted at junction with fastigium and divergent towards clypeus (Figs 208, 212). Fastigium elongate-parabolic (Figs 207, 211); its surface concave, sloping towards transverse sulcus. Latter roughly in mid-position. Foveolae distinct, kidney-shaped (Figs 206, 210). Pronotum somewhat compressed in middle. Medial carina distinct; lateral carinae often weak and little more than a chain of small callosities interrupted by all three transverse sulci, inflexed and convergent towards first sulcus, parallel between first and second, and broadly outflexed and divergent beyond. Metazona distinctly longer than prozona, its hind margin broadly rounded (Figs 205, 209). Genital structures are of little diagnostic value. Coloration variable; often dull in sombre shades of browns and greys with darker black and lighter stramineous and white speckling and mottling; fire melanism frequent. Distinctive pale patterns occur in less than a quarter of specimens, more often in males. These include a striking pale spot in lower part of lateral pronotal lobes and sub-basal part of upper face of hind femur, sometimes with two smaller, less distinctive spots further towards knee of hind femur (including a preapical ring before knee and a corresponding pale sub-basal ring on tibia). Hind knee black in male, paler brown in female. Dorsum generally paler, sometimes with a pale dorsal band of varying width; when narrow, usually bordered with dark blackish brown pigmentation. Sides often have a dark lateral band on genae and upper margin of lateral pronotal lobes. Underside of male abdomen towards its tip and lower outer (plus often inner faces of hind femur), ferruginous to reddish. Pale markings more striking in black melanic specimens and reddish tinge more intensive on maturation.

Discussion.—*G. temporalis* is the most common and widespread species in the genus. There is considerable clinal geographical variation in size, shape and coloration; subspecific taxonomic subdivisions are not warranted. Dirsh (1970) took the same view when synonymizing *G. emini* under *G. temporalis*. It appears to have a strategy of adult quiescence, 1–2 generations annually.

Distribution.—Found in the savannas and woodlands of the southern Sudanian and Guinean zones from SENEGAL and GAMBIA in the west to SUDAN and ETHIOPIA in eastern Africa, and southwards to southern Africa.

Gymnbothrus flexuosus (Schulthess, 1898)

Figs 213–224

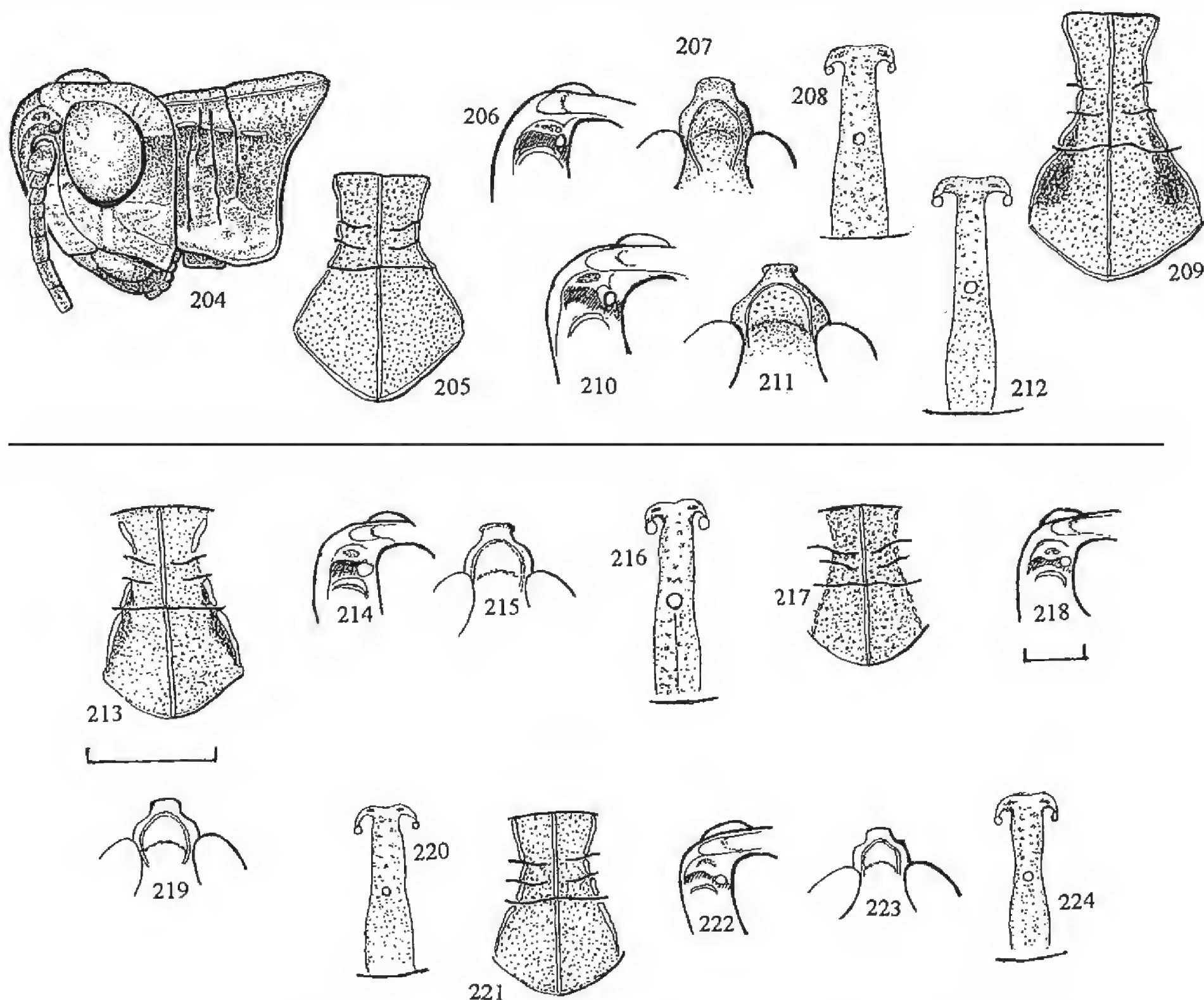
Duronia flexuosa Schulthess, 1898: 186, pl.2, fig. 9, type male, SOMALIA: Banas, Geneva Mus.

Chirista flexuosa Kirby, 1910: 143.

Zacompsa brevipennis Miller, 1929: 70, pl. 9, fig. 42, type male TANZANIA: Kilosa, NHMUK (syn. Kevan 1950).

Ogmothela brevipennis Ramme, 1931: 928.

² Dirsh 1965: 446, fig. 357, whole insect.



Figs 204–224. Tribe Gymnobothrini. Figs 204–212. *Gymnobothrus temporalis* male: 204. Oblique view head and pronotum. (205–208, topotype material *temporalis* from Namibia; 209–212, topotype material *emini*, D.R. Congo). 205, 209. Pronotal disc; 206, 210. Oblique view vertex; 207, 211. Dorsal view vertex; 208, 212. Frontal ridge. Figs 213–224. *Gymnobothrus flexuosus* male: (213–216, *brevipennis*; 217–220, Ethiopia, Wardere; 221–224, Angola). 213, 217, 221. Pronotal disc; 214, 218, 222. Oblique view vertex; 215, 219, 223. Dorsal view vertex; 216, 220, 224. Frontal ridge. Scale lines are all 1 mm: that under Fig. 218 applies to Figs 204, 205, 209, 213, 217, 221; that under Fig. 213 applies to Figs 206–208, 210–212, 214–216, 218–220 and 222–224.

Gymnobothrus subcarinatus (= *Pseudochirista subcarinata* I. Bolívar, 1922), type female. ETHIOPIA: Burka, MNHN, Paris. **syn. n.**

Material.— SOUTH SUDAN: Koalig hills; Imatong Mtns. SUDAN: Lomo. ETHIOPIA: Bourka (type locality of *Pseudochirista subcarinata* I. Bolívar); Lake Haramaia; Jigjiga; Bishoftu; Nr. Addis Abeba; Wardere; 15 mi. S.E. Harar. SOMALIA: Ischia Baidoa; Afmadu; Baun. KENYA: Moyale; Masai CIS Mara; Joroi; Orowa plain Kabete; Nairobi, Ngong Forest Res.; Mombasa; Turkana; Machakos; Athi; Thika; Diani Beach, Bura Garissa; Narossura R. Karura Forest; Lemek 01°07'S, 35°21'E; Mutomo-Mutha; Mutha hill; Sigiri Forest Res. 5350' (1630 m); Nguni Kora; Baragoi; Dwa; Limuru 6000' (1830 m); Kibwezi. I, II, III, VI, VIII, X. UGANDA: Lake George; Toror Hills; Teso; Chukwani. I, III, V. TANZANIA: Arusha; Tubugwe; Msimbazi R. Tanga; Old Shinyanga; Mkomasi stn. 60 m W. Amani. Msimbazi R, Tanga distr.; Kilosa; Muheza; Mhindulo; Tubugwe; Chilangali; Wuguru (type localities of *G. brevipennis* Miller) Tanga; Milingano; Morogoro; Wuguru; Zanzibar: Bububu. Kisese. II, III, IV, VI, VIII, XII.

Description.—Differs from *G. temporalis* in smaller size, shorter wings and different coloration. Size (in mm): total length males 12.5–15.0, females 20.0–25.0. Antenna filiform, in male longer than, in female as long as or slightly shorter than, length of head and pronotum. Fastigium of vertex oblong, trapezoidal, transverse sulcus slightly behind middle (Figs 215, 219, 223). Frontal ridge (Figs 216, 220, 224) and temporal foveolae (Figs 214, 218, 222) as *temporalis*. Pronotum less constricted and lateral carinae less divergent in metazona, latter only slightly longer than prozona (Figs 213, 217, 221). Wings short; folded apices level with, or only very slightly surpassing level of hind knee. Coloration differs from *G. temporalis* in more pronounced black markings on hind femora and color of lower areas being yellow-ochraceous and not reddish. Coloration somewhat resembles *G. anchietae* but can be distinguished from it by its heavier build, finer and longer antennae, more pronounced temporal foveolae, a shorter fastigium of vertex, and proportionately a longer metazona of pronotum.

Discussion.—Annual cycle similar to *G. temporalis*. Habitat described variously as: riverine forest; thicket and grass; banks of dry river; relic forest; scrub on waste ground. Life cycle probably continuous reproduction.

Distribution.—SUDAN, ETHIOPIA, KENYA, SOMALIA, UGANDA, TANZANIA: Zanzibar.

Macropterous group: The *anchietae* species sub-group

Discussion.—The species sub-group includes the nominate and three other taxa, which are here reduced to subspecies of *anchietae*. Synonymies and descriptions are given under each subspecies; full diagnosis of *Gymnbothrus anchietae bounites* (Jago, 1970), **stat. n. et comb.** is given under the brachypterous species group later in this paper.

Species notes

Gymnbothrus anchietae I. Bolívar, 1889

Figs 15, 225–246

Gymnbothrus anchietae I. Bolívar, 1889: 101.

Material.—See under nominate and other subspecies below.

Description.—Medium to slender build; size mostly small. Size (in mm): total length males 11.0–16.0, females 12.5–23.0. Integument punctured, finely to coarsely rugulose. Antennae short and incrassate, usually shorter than length of head and pronotum, but more elongate in *flaviventris*. Fastigium of vertex rounded-pentagonal, moderately (in *flaviventris*, considerably) longer than broad (Figs 227, 229, 241). Foveolae weak, usually narrow, punctured (Figs 240, 243). Pronotum moderately compressed, medial carina weak, cut by typical sulcus in its middle, with prozona slightly longer than metazona; lateral carinae regularly to irregularly incurved, mostly weak, and often obsolescent between first and second sulcus and partly or wholly in metazona, (in *inflexus* stronger and more angularly converging on first transverse sulcus (Fig. 244)). Tegminal apices extend slightly beyond hind knees in all subspecies, except *bounites*, in which they barely reach middle of abdomen. Genital structures show no differences between subspecies. Coloration in shades of brown, stramineous, ivory-white, grey and black, in mottled, striped and occasionally finely speckled patterns, which do not provide striking diagnostic features. In nominate subspecies face is often speckled and/or striped; dorsum is paler and occasionally with a narrow dorso-medial band edged with darker brown pigment. Lateral pronotal lobes are usually dark brownish in upper 2/3, with a contrasting large ivory-white spot in lower third (Figs 236, 239). Hind femur with faint dark bands on upper face; outer face brownish, and lower yellowish; hind knee brown, bordered by a pale ring which matches pale sub-basal ring on tibia. Tibiae otherwise ochraceous, somewhat blackened ventrally.

Key to subspecies in the *anchietae* species sub-group

- 1 Size exceptionally small, male <13mm, female <18mm; sculpturing pronounced; pronotal carinae thick and raised; lateral pronotal lobes with callose ridges in metazona. ETHIOPIAN highlands *anchietae inflexus* Uvarov 1934, **stat. n. et comb. n.**
- Size larger, sculpturing and pronotal carinae weaker 2

- 2 Brachypterous. TANZANIA: Ufipa plateau; ZAMBIA, MALAWI: Nyika plateau. *anchietae bounites* Jago, 1970, **stat. n. et comb.**
- Fully winged 3
- 3 Slender and elongate, fastigium of vertex much longer than broad (Fig. 241); antennae longer than head and pronotum; frontal ridge constricted at junction with fastigium. D.R. CONGO: Katanga, ZAMBIA, ANGOLA, BOTSWANA *anchietae flaviventris* Uvarov, 1953, **stat. n. et comb.**
- Antennae and fastigium shorter (Figs 228, 229); frontal ridge (Figs 230, 231). Widespread *anchietae anchietae* I. Bolívar, 1889, **stat. n.**

Subspecies notes

Gymnbothrus anchietae anchietae I. Bolívar, 1889, **stat. n.**

Figs 225–233

Gymnbothrus gracilis (Ramme, 1931) **syn. n.**

Ogmothela meruensis Ramme, 1931 (syn. with *G. gracilis* Uvarov 1953)

Ogmothela rammei Sjöstedt, 1931 (syn. with *G. gracilis* Uvarov 1953)

Gymnbothrus angolensis Uvarov, 1953 (syn. Dirsh 1966)

Material.—Holotype female *anchietae anchietae*: ANGOLA: Caconda, Quando. Moxico dist. Villa Luso (det. Uvarov after comparison with two cotypic females from Madrid Museum); type series *angolensis* Loanda. Also ANGOLA: S.W. Sa de Bandeira, 5600' (1705 m); Bruco; Rocadas; 10 mi. N.E. Cacula; Salazar; Duque de Bragança; Mt. Lubiri, 6 mi. N.E. Alto Hama; 3 mi. N.E. Negola; 8 mi. N.E. Cacula; Ceilunge; Calondo. Amboim; Cachociras 20 mi. S.W. Gabela. (Adults II, III, V, VII, X). BOTSWANA: Kuke Pan 20°59'S 22°25'E. NAMIBIA: Oshikango. TANZANIA: Shinyanga; Old Shinyanga; Tinde 20 mi. S.W. Shinyanga; Sigi, Nr. Amani; Ushora; Mpwapwa; Bukeni; Tanga; Mingano; Rukwa. KENYA: Nairobi; Ngare na Nyuki. ZAMBIA: Mporokoso; Mweru wa Ntipa; Mbala (as Abercorn). MALAWI: Nyika Nat. Park; nr. Chilenga. D.R. CONGO: Katanga, Chinchoxo.

Description.—As in key and under species. Size (in mm) total length: males 13.0–16.0, females 16.0–23.0.

Distribution.—ANGOLA, BOTSWANA, NAMIBIA, TANZANIA, KENYA, ZAMBIA, MALAWI, D.R. CONGO.

Gymnbothrus anchietae bounites Jago, 1970, **stat. n. et comb. n.**

Figs 234–238

Description.—See key. Full treatment in the brachypterous species group section (pp. 86 below).

Gymnbothrus anchietae flaviventris Uvarov, 1953,

stat. n. et comb. n.

Figs 239–242

Gymnbothrus flaviventris Uvarov, 1953: 126–127, fig. 135

Material.—Holotype *flaviventris*: ZAMBIA: Lueno valley, Chisorwe. D.R. CONGO: Katanga prov: Nasantoye. ANGOLA: Tundavala, 8–10 ml. N.W. Sa de Bandeira; 12 mi. S.W. Luimbale ca. 5500' (1675 m). BOTSWANA: Moremi Res. 19°23'S, 23°33'E. Adults II, III.

Description.—As in the key. Differs from nominate subspecies in its more elongate, slender build; longer antennae; more slender, sulcate frontal ridge; more elongate fastigium of vertex. General coloration similar to nominate subspecies. Measurements (in mm): Total length male 15, female 19.

Distribution.—ZAMBIA, D.R. CONGO, BOTSWANA.

Gymnobothrus anchietae inflexus Uvarov, 1934,
stat. n. et comb. n.
Figs 243–246

Gymnobothrus inflexus Uvarov, 1934: 603, fig. 6.

Material.—ETHIOPIA: Mt. Chillalo, moorland at 10,000' (3050 m), XI.1926; Oinchu Park Lodge, 3170 m., short turf bush heath, V.1975; 07°57'N 39°08'E, 2400m., IV.1975.

Description.—As in key. Exceptionally small size. Size (in mm): males 11.5–12.0, females 17.0–18.0. Rugulose integument. Short thick antennae. Well-defined temporal foveolae. Shape of pronotum diagnostic, with weak second sulcus and strong callose carinae. Coloration (as in *bounites*), predominantly in shades of dark brown and black.

Discussion.—Records of *inflexus* in SOMALIA given by Johnsen and Schmidt (1982) and by Baccetti (1984) are probably misidentifications of *G. flexuosus* (Schulthess).

Distribution.—Limited localities in highland ETHIOPIA. Also recorded from KENYA (Emali Hills) by Kevan (1950), and from UGANDA (Kampala) by Jago and Rowell (unpublished).

Brachypterous group

Discussion.—There are only two members in the brachypterous species group of *Gymnobothrus*: *G. anchietae bounites* Jago, 1970 and *Gymnobothrus rimulatus* (Karsch, 1896). However, apart from their shared character of brachypterism, they belong to two separate and distinctive species groups of the genus: *bounites* is a subspecies of *G. anchietae* and its diagnosis is included in the key to the other subspecies, while *G. rimulatus* is a close relative of *G. inflexus* and is described in some detail below.

Species notes

Gymnobothrus anchietae bounites Jago, 1970,
stat. n. et comb. n.
Figs 234–238

Gymnobothrus bounites Jago, 1970: 123, 205.

Material.—Very large type series of *bounites*: S.W. TANZANIA: S.E. of Mbeya, Rungwe Mt., 2 mi. S.E. of Kiwira Forest Station; 4.7 mi. along Kiwira-Mbeya road; Ufipa plateau, 12 mi. E. of Sumbawanga; Mbisi Forest Reserve, S.E. of Rungwe Mt., tree fern gorge; Mbeya Mt. N.E. of Mbeya, 8000' (2440 m). In addition: TANZANIA: Poroto Mts. ZAMBIA: Nyika Plateau 7300' (2225 m). MALAWI: Nyika Nat. Pk. nr. Chilenga.

Description.—As in the key given above. Differs from nominate subspecies in its short wings; small size and slender build. Fastigium of vertex shorter, parabolic (Fig. 237). Coloration dark brown

to blackish with medial dorsal brown or creamy stripe. Antennae black apically, light brown in basal half. A broad dark lateral band extends from antennal sockets across genae, upper 3/5 of pronotum to pleurae. Abdominal tergites shiny black. Hind femora reddish-brown, lighter below; knees dark brown to sooty black. Hind tibiae light to dark grey.

Distribution.—S.W. TANZANIA, ZAMBIA, MALAWI. Inhabits plateau grasslands spanning the Mbeya valley, linking the hills of northern MALAWI and southern TANZANIA faunistically with those of the Ufipa Plateau (Jago 1970).

Gymnobothrus rimulatus (Karsch, 1896)
Figs 247–258

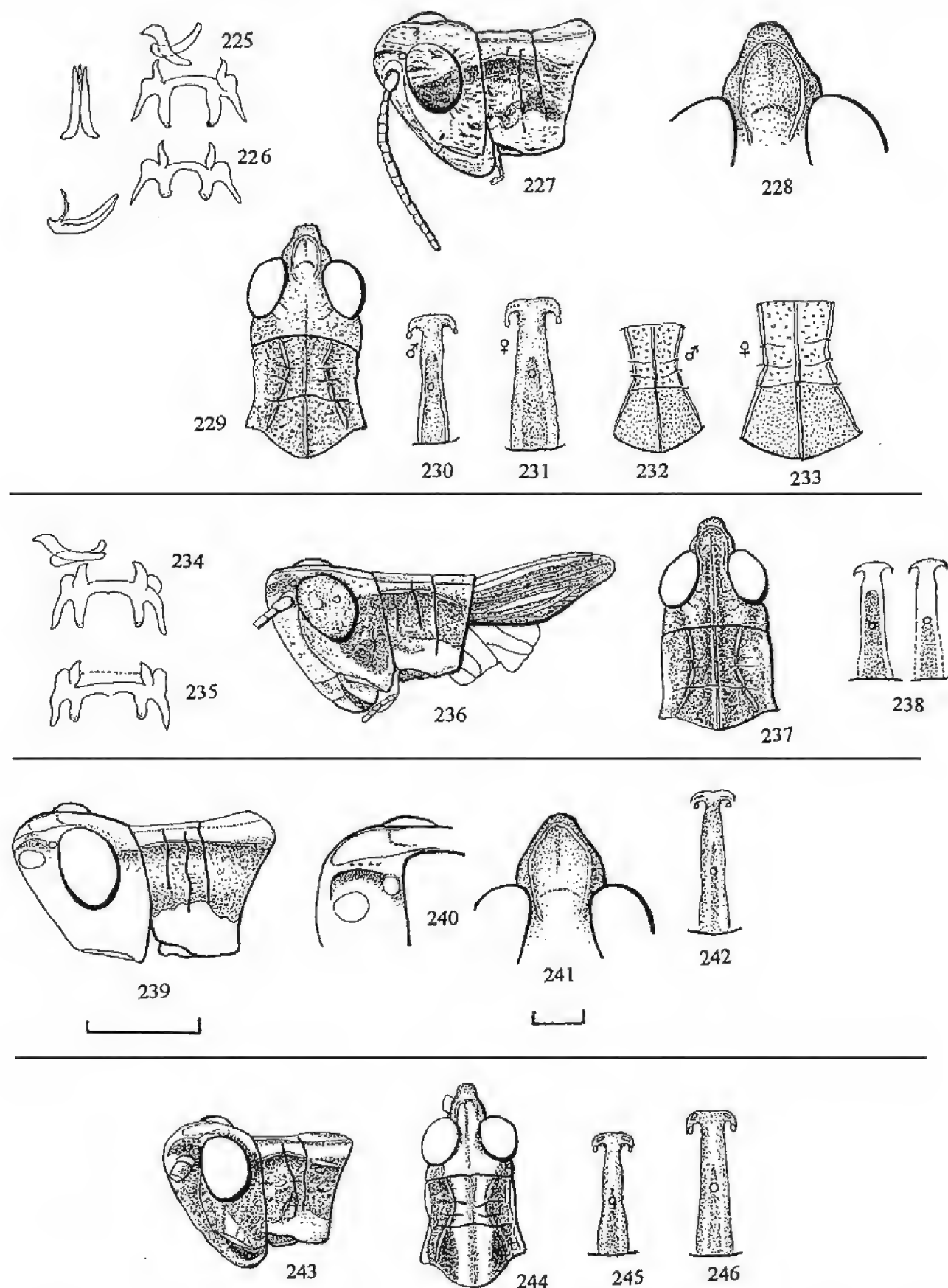
Ogmothela rimulata Karsch, 1896: 260.
Gymnobothrus rimulata Uvarov, 1953: 123–124.

Material.—Holotype *rimulata*: KENYA: Mombasa, Berlin; Kilindini; Watamu; Malindi, Driftwood Beach Club, grass, bushes and leaf litter behind beach; Kilifi dist., Arabuko-Sokoke, forest, clearings and path side; 20 km. N. Malindi, dunes N. of Mambrui; Lamu dist. 29 km. E. of Manjila, *Diospyros-Dobera* woodland; Kwale dist. Jombo hill, ca. 800–1000', foot of slope, in clearings. Mwamberu stn. 1000' (305 m) 03°45'S, 39°13'E (I, II, III, IV, VI, VII, XI). TANZANIA: Victoria Nyanza, Ukerewe I.; Mahali Peninsula, Ujamba; Singida dist. 14 mi. N. of Mkalama; Old Shinyanga; Ngonghoo River; Manyara Nat. Park, groundwater forest and adjacent forest; Gibbs farm, Karatu; Ngorongoro (NHMUK) (Adults: VII, VIII, IX, XI).

Description.—Of medium size, robust build. Size (in mm): males 14–16, females 18–22. Integument finely pitted and rugose. Frontal ridge thick, barely sulcate, with subparallel, somewhat undulating, thick margins (Fig. 250). Fastigial constriction weak. Fastigium of vertex oblong/parabolic with weak margins (Figs 248, 249); transverse sulcus weak, roughly in mid-position. Structure of pronotum variable, from roughly the shape found in *G. flexuosa*, to that in *G. cruciatus* (Figs 251–253); transverse sulci strong; lateral carinae weak to strong, obsolescent towards rear of metazona and occasionally weaker between 1st and 2nd sulci; length of metazona equal to subequal to that of prozona. Tegmina with more or less rounded to attenuate apex, varying in length from equal to length of pronotum (as in coastal populations in Kenya) to more than twice its length (as in some specimens from Tanzania, notably those from Manyara) (Figs 255–257). Hind femora rather robust; arolia rather small (e.g. in comparison with *G. t. temporalis*).

Coloration rather similar to that in *G. t. flexuosus*, in shades of browns, ochraceous, stramineous and ivory-white with presence of light and dark forms; some of latter resemble a duller version of Tanzanian populations of *G. pullus*. Antennae dark brown, dorsum pale entirely or sometimes with a narrow dorso-medial band bordered with dark brown; costal area of tegmina dark brown; anal area stramineous. Body sides with a broad dark band in upper part extending from frons across genae, pronotal lobes and pleurae onto tegmina; lower third of lateral pronotal lobes and pleurae pale. Upper face of hind femur with a large pale sub-basal and a sub-apical spot; outer face brown, lower ferruginous to orange; hind knee black, hind tibia slate blue to brownish, with a broad sub-basal white ring, tarsi ivory; spines ivory, tipped black.

Distribution.—KENYA, TANZANIA.



Figs 225–246. Tribe Gymnobothrini. *Gymnobothrus anchietae*. Figs 225–233. *Gymnobothrus anchietae anchietae*: 225, 226. Epiphallus (Rukwa); 227. Male oblique view head and pronotum; 228. Male dorsal view vertex; 229. Male dorsal aspect head and pronotum; 230, 231. Male, female, frontal ridges; 232, 233. Male, female pronotal discs. Figs 234–238. *Gymnobothrus anchietae bounites*: 234, 235. Epiphallus; 236. Male, oblique aspect head, pronotum and tegmina; 237. Dorsal aspect head and pronotum; 238. Male frontal ridge. Figs 239–242. *Gymnobothrus anchietae flaviventris*: 239. Male oblique view head and pronotum; 240. Oblique view vertex; 241. Dorsal view vertex; 242. Male frontal ridge. Figs 243–246. *Gymnobothrus anchietae inflexus*: 243. Male oblique aspect head and pronotum; 244. Same, dorsal aspect; 245. Male frontal ridge; 246. Female same. Scale lines all 1 mm: that under Fig. 239 applies to Figs 225, 226, 228, 230, 231, 234, 235, 238, 240–242, 245–246; that under Fig. 241 applies to Figs 227, 229, 232, 233, 236, 237, 239, 243, 244.

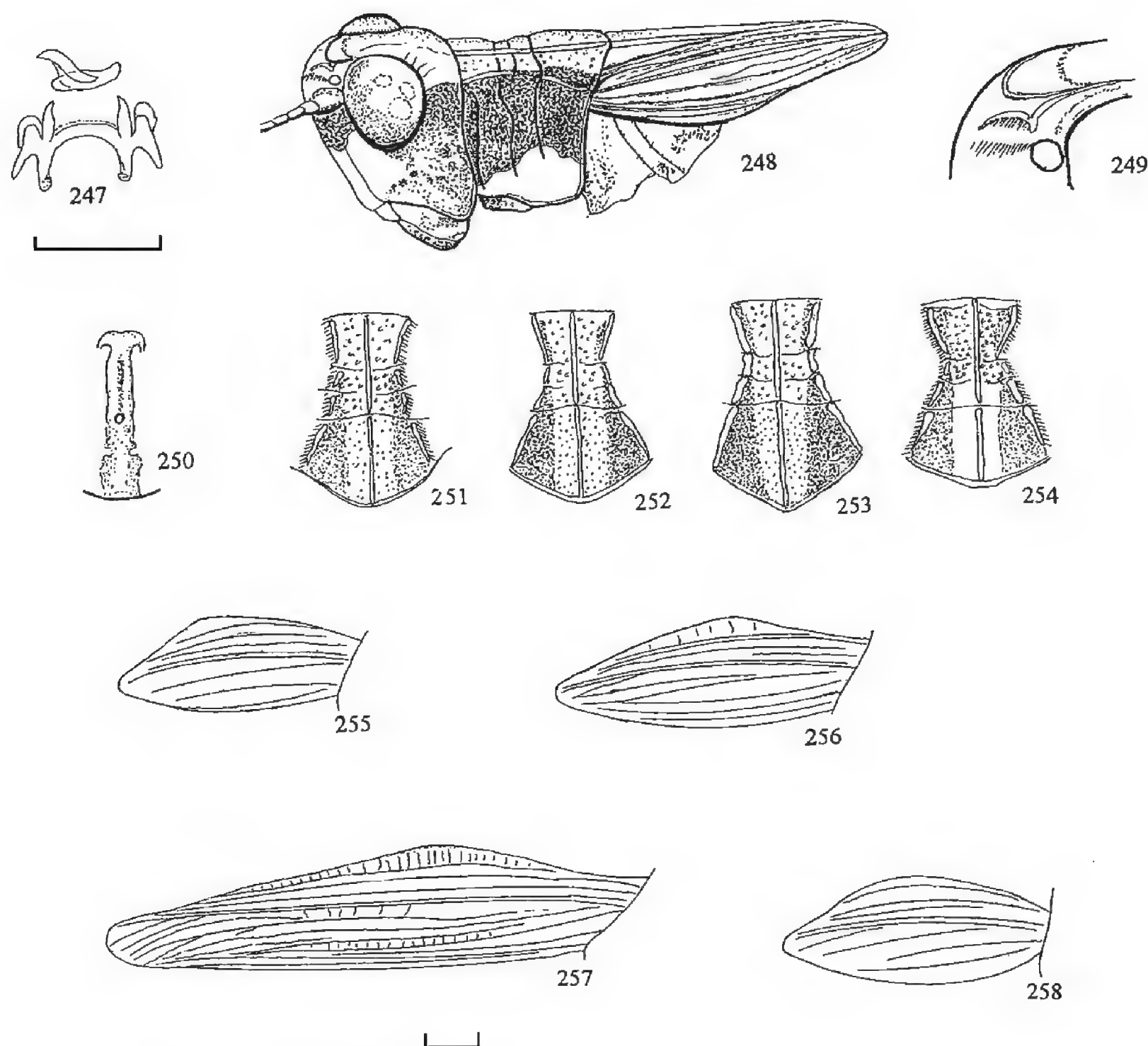
Micropterous group

Discussion.—This includes taxa previously included under *Gymnobothroides*. The affinities of the genus *Gymnobothroides* and the phylogenetic problems that it presents have been discussed by Uvarov (1953) and Jago (1968, 1970), both commenting on its close relationship to *Gymnobothrus* and that it is strictly definable at present only on the basis of tegminal abbreviation. The bridge afforded between the two genera provided by *G. rimulatus* removes the justification for continued maintenance of *Gymnobothroides* as a separate genus.

Of the taxa placed in *Gymnobothroides* by Jago (1968, 1970), *G. amplificata amplificata* Johnston and *G. amplificata morotoensis*

Jago were transferred by Bouvy (1982) to *Rastafaria*. In this review (above) they have been reallocated to *Coryphosima*, to join *cytidonota*, Jago, already placed under that genus by its author. The following micropterous taxa previously in *Gymnobothroides* are here transferred to *Gymnobothrus*: *pullus pullus* Karny, 1915 (syn. *minutus* Ramme (Dirsh 1970), here reinstated as a subspecies of *pullus*); *pullus montanus* (Kevan, 1950); *levipes* (Karsch, 1896); *keniensis* Johnston, 1937; *hemipterus* Miller, 1932.

Only two full species are recognized here: *pullus* (Karny, 1915) and *levipes* (Karsch, 1896). The remaining taxa listed above considered as subspecies of one or the other.



Figs 247–258. Tribe Gymnobothrini. *Gymnobothrus rimulatus*. Fig. 247. Epiphallus; 248. Female oblique view head, pronotum and tegmina; 249. Male oblique view vertex; 250. Male frontal ridge; 251–253. Variation in male pronotal disc; 254. Same, intermediate to subsp. *pullus*; 255–257. Male tegminal variation; 258. Male tegmen intermediate to subsp. *pullus*. Scale lines all represent 1 mm: that under Fig. 247 applies to Figs 247 and 249; that under Fig. 257 applies to all the rest.

Key to species in the micropterous group of *Gymnobothrus*

- 1 Larger and more robust; antennae elongate and slender, in males considerably longer than, in females as long as or only slightly shorter than length of head and pronotum. Compound eyes round and protruding (Fig. 278). Hind margin of pronotal disc rounded; lateral carinae interrupted by all three sulci (Figs 284–286). Tegmina broadly rounded, less than twice as long as broad (Figs 287, 288). Coloration in contrasting dark brown and cream, bands; tip of abdomen and underside of hind femora ferruginous-reddish or ochraceous. KENYA, TANZANIA, D.R. CONGO, RWANDA, SOUTH AFRICA.....
..... *pullus* (Karny, 1915), **stat. n. et comb. n.**
- Smaller and more slender; antennae incrassate and somewhat dilated basally; in male barely as long as head and pronotum, in female much shorter. Compound eyes not unduly protruding, more elongate and pointed apically (Fig. 259). Hind margin of pronotum emarginate; lateral carinae rather less divergent and usually interrupted only by typical sulcus (Figs 261, 262). Tegmina more elongate and narrow (Fig. 258). Coloration in more cryptic shades of browns

and greys (and rarely with some green pigmentation). TANZANIA, KENYA.....*levipes* (Karsch, 1896), **stat. n. et comb. n.**

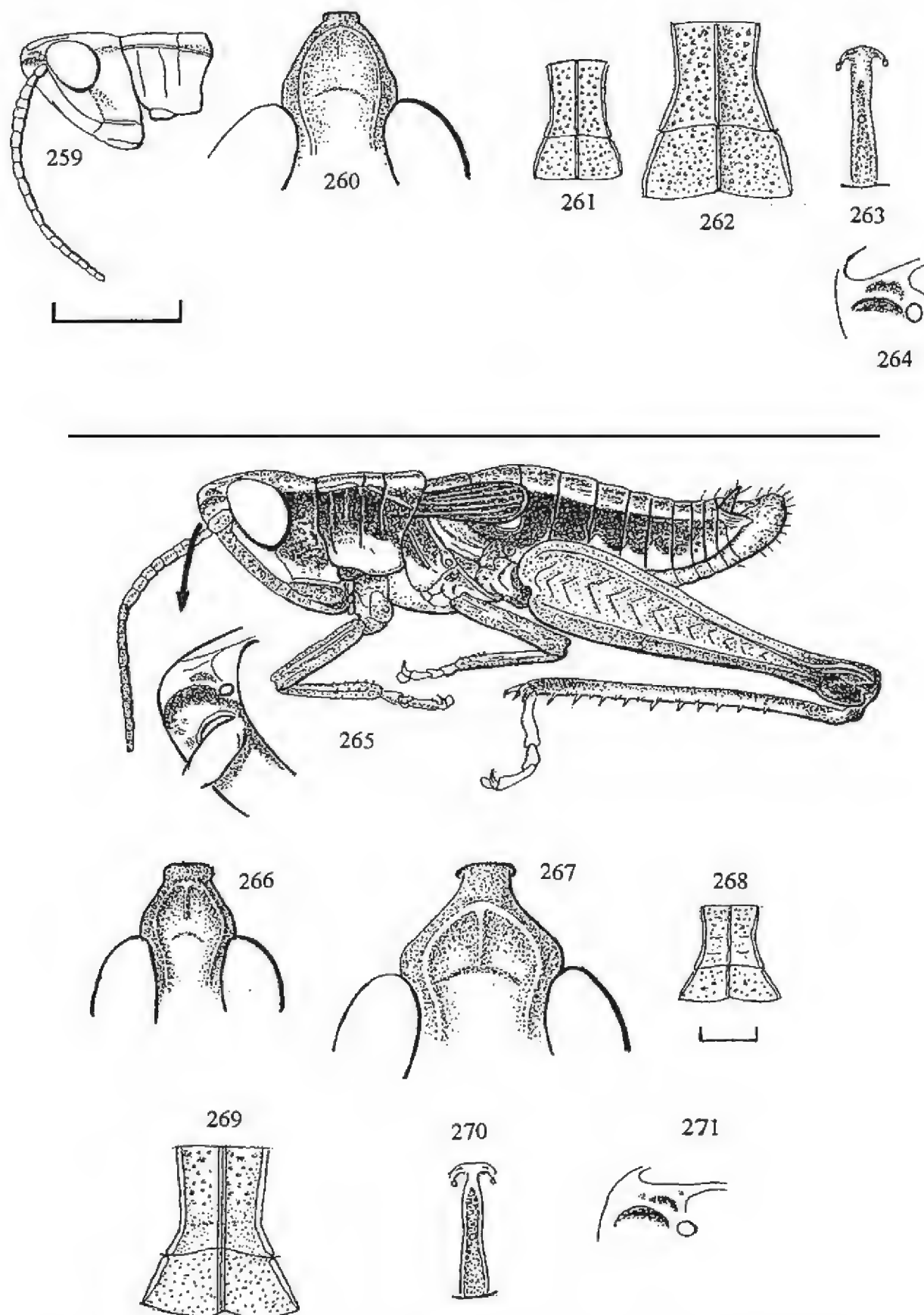
Gymnobothrus levipes (Karsch, 1896), **comb. n.**

Figs 259–271

Chrysochraon levipes Karsch, 1896: 255. Types Kilimanjaro (MfN).

Key to subspecies of *G. levipes* in the micropterous group

- 1 Slightly larger and more slender, frontal ridge broader and less deeply sulcate; tegmina broader, more rounded apically. More uniform coloration in shades of brown and ochraceous; lower sulcus of hind femur orange-ochraceous. TANZANIA: Kilimanjaro and Taita hills; KENYA.....*levipes levipes* (Karsch, 1896), **stat. n. et comb. n.**
- Slightly smaller and more robust, frontal ridge narrower and more deeply sulcate; tegmina narrower, width little more than half the length. Coloration more varied and contrasting in marbled patterns of grey and dark brown. C. KENYA, notably the slopes of Mt. Kenya.....*levipes abbreviatus* (Chopard, 1921), **stat. n. et comb. n.**



Figs 259–271. Tribe Gymnobothrini. *Gymnobothrus levipes*. Figs 259–264. *Gymnobothrus levipes levipes* male: 259. Lateral aspect head and pronotum; 260. Dorsal view apex of head; 261, 262. Male, female pronotal discs; 263. Frontal ridge; 264. Temporal foveolus. Figs 265–271. *Gymnobothrus levipes abbreviatus* male: 265. Entire insect (*Gymnobothroides keniensis* Johnston 1937, n. syn.); inset below an enlargement of apex of head showing temporal foveolus; 266, 267. Male, female, dorsal view vertices; 268, 269. Male, female pronotal discs; 270. Frontal ridge; 271. Temporal foveolus. All scale lines represent 1 mm: that below Fig. 259 applies to Figs 260, 264, 266, 267, 271; that below Fig. 268 applies to Figs 259, 261–263, 265, 268–270.

Species notes

Gymnobothrus levipes levipes (Karsch, 1896), stat. n. et comb. n.
Figs 259–264

Chrysochraon levipes Karsch, 1896: 255

Gymnobothroides levipes (Karsch, 1896) (syn. Johnston 1956)

Gymnobothroides montanus Kevan, 1950 syn. n.

including *Gymnobothroides pullus montanus* Jago, 1968

Material and discussion.—Lectotype male *levipes* here designated: TANZANIA: Mt. Kilimanjaro, Djagga, Madjame. MfN. 2 female paralectotypes, same data, MfN. Additional specimens: TANZANIA: Arusha, Grevillea Plantation, II; E. of Mt. Meru, Ngurdoto

Lake Crater, XI; E. side of Mt. Meru, 6150' (1875 m), Ngurdoto Nat. Park VI. KENYA: Type locality of *montanus* Kevan: Taita hills, 4500–5500' (1370–1675 m), grass and bushes, 25.XII.1945; Taita Farmer Training Centre, 8 km. S. of Wundanyi (03° 26'S 38° 20'E), 5400' (1645 m), V.1975. Following material from KENYA exhibits clinal links with *abbreviatus*: Machakos, Malili Ranch, IV; Nairobi, Karen-Ngong Rd. II. These are generally of smaller size with shorter antennae narrower tegmina and brighter coloration (NHMUK).

Description.—Synonymy and species diagnosis as above. Differs from subsp. *abbreviatus* as follows: proportionately slightly larger size, more slender build; size (in mm): total length males 11–14, females 18–20; slightly longer antennae; somewhat broader and less sulcate frontal ridge; slightly less constricted pronotum (but

similar otherwise in that lateral carinae are interrupted only by typical sulcus and hind margin of metazona is emarginate) (Figs 261, 262); broader, more rounded tegmina (Fig. 258) and a more uniform coloration, in type material of *levipes* from 'Kilimanjaro', specimens from Arusha in Tanzania and types of *montanus* from Kenya, Taita hills in southern Kenya, general coloration is reddish-brown; lateral dark band is faint and lower area of hind femur is in shades of orange; this may, however, be in other shades of brown and stramineous; lower area of hind femur is ochraceous.

Discussion.—Study of the three syntypes of *Chrysochraon levipes* Karsch, 1896 has shown them to be conspecific with the two types of *Gymnbothroides montanus* Kevan, 1950, differing only in the slightly smaller size of the former. The male syntype is here designated as lectotype and the two females as paralectotypes. The closest match with the lectotype specimens of *levipes* are specimens from Mt. Meru-Ngurdoto National Park, Momella Lakes and W. Usambara, Mazumbai Forest Res.

Distribution.—S. KENYA; N. E. TANZANIA.

***Gymnbothrus levipes abbreviatus* (Chopard, 1921),
stat. n. et comb. n.
Figs 265–271**

Phloeobida abbreviata Chopard, 1921: 48–50, figs 28, 29

Phloeochopardia abbreviata (Dirsh, 1958)

Gymnbothroides keniensis Johnston, 1937 syn. n.

Material.—KENYA: (as Brit. E. Africa), Nairobi, 1 male, 1 female types of *Phloeobida abbreviata* Chopard 1921 (MNHN). 1 male, 3 females, types of *Gymnbothroides keniensis* Mt. Kenya, (above 8,000', 2440 m) (NHMUK); Brit. E. Africa, 1 male, Karati Kikuya; 1 female, Ngalano, (Gregory Coll. 94–94), both bearing Ramme, det. "*Chortoicetes levipes*"; Kijabe section, Kikuyu Escarpment, 8200' (2500 m), VI; Nairobi, Sigiri For. Res. Stn., Limuru rd 5350', XI; E.A.A.F.R.O., Muguga, 14 mi. N. Nairobi, 6800' (2070 m), V. Limuru, VI; Nairobi, Balmoral/Ngong rd. 01° 17'S 36° 45'E, 5500' (1675 m); Nara Moru 00° 9'S 37° 02'E, 6000' (1830 m), III; 49 kms. N.W. Nairobi, hillside forest path, VI; 1° 23'N 36° 38'E, grass/bush/shrubs, IV; S. side of Mt. Kenya, Ragati For. Res. XII; Limuru, VI; Nakuru rd., Kenya Nat. Agric. Inst. relict forest, I; Kitibo Coffee Est., Makuyu 00° 53'S, 37° 17'E, 1550 m, IV; 48 km E Makutano, 5600' (1705 m) *Ficus* forest, IX; homotypes *P. abbreviata* Chopard, Karen-Ngong rd, forest, II; homotypes of *G. keniensis* Johnston; Thika rd. 38° 41'E 00° 44' S, 8400' (2560 m) grassland and degraded forest; Ngong hills, 8000' (2440 m), V; Mfunguni hill, Tulia, Kitui, 01° 12'S, 38° 02'E, *Combretum-Commiphora-Acacia* woodland; Ol Donyo Sapuk, nr. mt. summit, 7040', 01° 08'S, 37° 15'E, V, cleared bush; Chyulu hills, 38 kms E. of Makutano 4900' (1495 m), forest on old lava mountain, savanna/woodland mosaic, IX; Karen, XI; Ngong hills, 7000' (2135 m), XI; between Nairobi and Limuru, VIII; Karura forest, VII; Mt. Kenya, VIII–X; Kabete, nr. Nairobi, IV.

Description.—Synonymy and recognition as above. Size small; see measurements in Table 9; of medium build; integument rugulose, shiny. Antennae short, incrassate, flattened and often weakly expanded basally, barely as long as head and pronotum in male, distinctly shorter and more slender in female. Frontal

ridge narrow, sulcate, narrowed at junction with fastigium, divergent below ocellus. Fastigium of vertex moderately concave, elongate-parabolic in male, rounded in female, margins low but distinct; medial carinula distinct sometimes continuing onto occiput, transverse sulcus very weak; fastigial rim narrow. Foveolae weak, often as disjunct scattered pits of varying size, occasionally coalescing into an elongate shallow depression, usually open towards antennal socket. Pronotum somewhat constricted in middle, expanding caudad; typical sulcus strong, others weak or obsolete; medial carina broad, occasionally very narrowly divided lengthways, especially in females; lateral carinae strong, roundly converging towards first sulcus, broadly diverging thereafter, but incurving and weakening or disappearing towards the rear of metazona (latter a little more than half length of prozona, its hind margin broadly emarginate (Figs 268, 269)). Tegmina scale-like, convex, with raised callose veins, about as long as, or very slightly longer than, pronotum; width little more than half their length (Fig. 265). External and internal genital structures typical for group, without marked distinctive features. Hind femora of moderate build, length-width ratio about 4. General coloration striped and marbled in cryptic shades of browns and greys, usually paler dorsally with a more or less marked broad lateral dark fascia extending from antennal socket across genae, upper half of lateral pronotal lobes to pleurae and on to sides of abdomen, where pigmentation often becomes more intense; underside pale ochraceous-yellow, more brightly so in males; femora brownish-rusty-brown above, paler below, with lower area orange-yellow; hind tibiae brownish, with inner face darker.

Discussion.—Color pattern and morphology seem to vary with habitat terrain, as follows: Chyulu hills with forest on old lava, savanna/woodland mosaic (very rugose and exceptionally dark, frontal ridge broad, sulcate, foveolae narrow, crescentic, antennae rather long and dilated at base); Ol Donyo Sapuk, near mountain summit, cleared bush (frontal ridge deeply sulcate, foveolae large, strong); Nakuru Rd. relict forest (strongly rugose and pitted; frontal ridge moderately sulcate, with wavy margins, foveolae weak, coloration brown-stramineous to blackish-brown); 49 km. NW Nairobi, hillside, forest path (occiput, disc of pronotum and anal area of tegmina with greenish pigmentation); Naro Moru (more robust, distinct temporal foveolae and straighter pronotal carinae; brighter coloration; larger (male 13–14 mm) and generally paler, more brightly colored specimens; frontal ridge less sulcate); Kikuyu Escarpment – small, dark specimens (close match of types of *keniensis* Johnston and *abbreviata* Chopard).

The two specimens in the NHMUK det. '*Chortoicetes levipes* Karsch' by Ramme, in very poor condition, both from KENYA, are misidentifications; they closely resemble the types of *Gymnbothroides keniensis* Johnston, 1937 (NHMUK), which themselves are junior synonyms of *Phloeochopardia abbreviata* (Dirsh, 1958) (= *Phloeobida abbreviata* Chopard, 1921, types (MNHN) examined).

There is some geographical and ecological variation; as a rule, specimens from altitudes above about 7000' (2135 m) tend to be smaller and darker with a more rugulose and sculptured integument than those from lower altitudes. Some of the latter, particularly from southern Kenya towards Tanzanian border, exhibit clinal changes towards *G. l. levipes*, (e.g. in their larger size and longer, more slender antennae).

Distribution.—KENYA.

Table 9. Morphometric measurements of *Gymnobothrus levipes abbreviatus*.

	M (mm)	F (mm)
Antennae	4.5	4.5
Tegminal length	2.1	3
Tegminal width	1	1.4
Hind femur length	8–9	9–11
Hind femur depth *	2	2.7
Hind femur L/D ratio *	4–4.5	3.3–4.1
Total length	10.5–13	14–17
Total length *	10.5–12*	14–15.5*

*Kikuyu road material

Gymnobothrus pullus* (Karny, 1915), comb. n.Gymnobothroides pullus* Karny, 1915: 134.*Description.*—As in key to species.*Discussion.*—See below.**Key to subspecies of *G. pullus* in the micropterous group**

- 1 Larger (male 12–14 mm, female 16–22 mm), structurally more variable, lateral pronotal carinae vary from roundly inflexed (as in *G. temporalis*) to angularly converging (as in *G. cruciatus*). Tegmina vary in size and shape (Figs 280–281, 287–288). C. and E. TANZANIA; C. and S. KENYA.....*Gymnobothrus pullus pullus* (Karny, 1915), stat. n. et comb. n.
- Smaller (male 12–13, female 15–20 mm) 2
- 2 Coloration strongly contrasting; frontal ridge narrower. D.R. CONGO: Lake Kivu; RWANDA: Kisenye.....*G. pullus minutus* (Ramme, 1929), stat. n. et comb. n.
- Coloration less contrasting, in lighter shades of brown; frontal ridge broader. SOUTH AFRICA: Kwazulu-Natal; LESOTHO.....*G. pullus hemipterus* (Miller, 1932), stat. n. et comb. n.

Species notes***Gymnobothrus pullus pullus* (Karny, 1915), stat. n. et comb. n.³**
Figs 272–288

Material.—TANZANIA: Type locality Dar es Salaam; Sigi, near Amani, 1500' (460 m), V, XI; Morogoro; Mahange dist, Kakara, VI; 2 mi. E. Gilodari, S. of Yasda R.; Ngurdoto, edge of forest, I, IV; Munega Magna; Ngorongoro; Morogoro dist. Bunduki, IX,II,III; Lushoto dist. Soni, 3000' (920 m); Arusha; Usambara; Mpwapwa, 5500' (1675 m); Mwanza; Old Shinyanga; Gibbs Farm, Manyara; Ngorongoro, III, IV, X. KENYA: Samburu dist; Ngong hills, 7000' (2135 m), XI; Nairobi-Limuru, 6000' (1830 m) VII; Karura forest VIII; Lasenie VIII. (NHMUK).

Description.—Recognition as in key to species. Size (in mm): total length males 12–14, females 16–22. Integument rugulose, prozona coarsely, metazona finely, punctured. Antennae slender, slightly flattened basally; in male longer than, in female subequal

to, length of head and pronotum. Compound eye large, protruding and rounded (Fig. 278). Frontal ridge (Fig. 282) rather broad with thick margins. Fastigium of vertex pentagonal, elongate in male (Fig. 279), round in female; foveolae as small shallow pits (Fig. 283). Pronotum weakly compressed in middle, somewhat variable in shape; lateral carinae vary from weak to strong and from roundly inflexed (as in *G. temporalis*), to straight and angularly converging (as in *G. cruciatus*) (Figs 280, 281, 284–286) and interrupted by all three strong transverse sulci; metazona proportionately broader than in *levipes*, its hind margin broadly rounded, not emarginate. Tegmina broad, somewhat varying in size and shape (Figs 287, 288). At extremes of tegminal and pronotal variation (Figs 254, 258), some specimens, e.g. from Shinyanga and Manyara, exhibit clinal links with *G. rimulatus*, which constitutes a remarkable example of a connection between two taxa originally attributed to two different genera. Genital structures typical of group and diagnostically not distinctive.

Coloration in bright contrasting pattern of broad dark and light longitudinal stripes, similar to that in *Zacompsa festa*; a dorso-medial ivory-white stripe extending whole length from fastigium to tip of abdomen is flanked by broad dorso-lateral black to blackish-brown stripes extending from antennal socket and including antennae, across genae, pronotal lobes and tegmina, gradually narrowing towards tip of abdomen; below this there is another somewhat narrower pale stripe, extending from lower genae, lower third of pronotal lobes to pleurae; underside is yellowish suffused with a ferruginous tinge, becoming a brighter reddish orange towards tip of abdomen and lower face of hind femora, which are a darker brown above with a black knee; hind tibiae slate-grey to brownish, with a pale sub-basal ring.

Discussion.—Nominate subspecies is larger and more robust than *G. levipes* (Karsch, 1896) and also larger than the other two subspecies, *pullus minutus* (Ramme, 1931) and *pullus hemipterus* (Miller, 1932).

***Gymnobothrus pullus minutus* (Ramme, 1929),
stat. n. et comb., nom. res.
Figs 289–292**

Gymnobothroides minutus Ramme, 1929.*Gymnobothroides pullus* (Karny, 1915, 1929) (syn. Dirsh 1970).

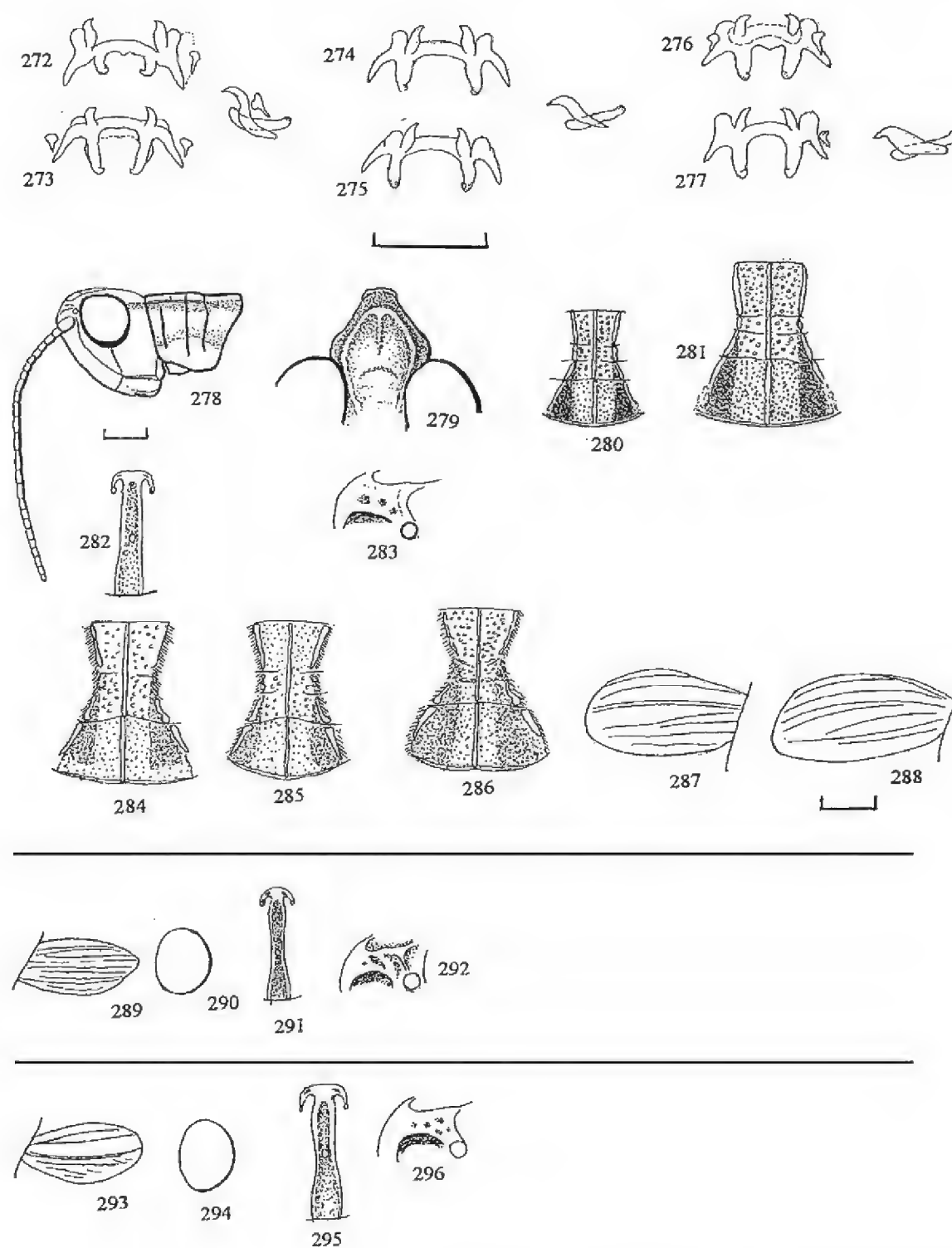
Material.—D.R. CONGO: Lake Kivu: Goma, 05°19'S 14°24'E. Lwiro River, 47 km N. of Bukavu. RWANDA: Kisenye. Adults II, VIII, XII.

Description.—Differs from nominate subspecies in its smaller size (in mm: total length males 12–13, females 15–20); narrower, more deeply sulcate frontal ridge (Fig. 291); more elongate, apically pointed eye and apically attenuate tegmina (Figs 289, 290). Coloration very similar to nominate subspecies.

Discussion.—Described originally as *Gymnobothroides minutus* Ramme, 1929, and synonymized by Dirsh (1970) under *Gymnobothroides pullus* Karny, 1915, this taxon is recalled here as a valid subspecies.

Distribution.—Known from eastern D.R. CONGO and RWANDA.

³ Dirsh 1965: 447, fig. 358, whole insect, male, and epiphallus (as *Gymnobothroides pullus* Karny).



Figs 272–296. Tribe Gymnobothrini. *Gymnobothrus pullus*. **Figs 272–288.** *Gymnobothrus pullus pullus*: 272–277. Variation in epiphallus (272, 273, Tanzania, Amani; 274, 275, Tanzania, Mwanza; 276, 277, Malawi); 278. Male, lateral aspect head and pronotum; 279. Dorsal view male vertex; 280, 281. Male, female pronotal discs; 282. Frontal ridge; 283. Temporal foveolus; 284–286. Variation in male pronotal disc; 287, 288. Variation in male tegmen. **Figs 289–292.** *Gymnobothrus pullus minutus* male: 289. Tegmen; 290. Compound eye; 291. Frontal ridge; 292. Temporal foveolus. **Figs 293–296.** *Gymnobothrus pullus hemipterus* male: 293. Tegmen; 294. Compound eye; 295. Frontal ridge; 296. Temporal foveolus. All scale lines represent 1 mm: that below Fig. 275 applies to Figs 272–277, 279, 283, 292, 296; that below Fig. 288 applies to Figs 280–282, 284–288, 291, 293–295, 289, 290; that under Fig. 278 applies to 278 only.

Gymnobothrus pullus hemipterus (Miller, 1932), stat. n. et comb. n.
Figs 293–296

Gymnobothroides hemipterus Miller, 1932.

Material.—SOUTH AFRICA: Kwa-Zulu Natal, nr. Weenen, N’Kolombe Mt., 5000’ (1525 m). LESOTHO: Maputo (NHMUK).

Description.—Similar in size to *minutus*, size (in mm): total length males 12–14, females 16–20) but differs in a broader, deeply sulcate frontal ridge. Eye elongate as in *minutus* (Fig. 294). Tegmina rounded apically as in *pullus* (Fig. 293). Fastigium of vertex similar to that in *pullus*; foveolae as scattered small pits (Fig. 296). Lateral pronotal carinae, said to be obsolete in original description, are in fact fairly well-developed in some specimens from both KwaZulu-Natal and Lesotho. Coloration less contrasting than in other subspecies, in duller, paler shades of brown; underside and lower area

of hind femora reddish brown, hind knee black; hind tibiae black basally, remainder blackish brown.

Discussion.—Here reduced in rank from species to subspecies.

Distribution.—SOUTH AFRICA: KwaZulu-Natal; LESOTHO.

Generic diagnosis

Brachybothrus gen. n.

<http://zoobank.org/4326112F-5DD3-40EF-9FC1-C67CCFD98DEC>

Type species.—*Brachybothrus phyllopterus* sp. n. here designated.

Description.—Small, integument rugose and callose. Antennae as long as, or slightly shorter than, head and pronotum, weakly compressed basally and incrassate apically. Head somewhat in-

flated and rounded in profile; frontal ridge narrowly sulcate above ocellus, with margins below thick and divergent. Fastigium deeply concave, pentagonal, pointed apically, with sharp raised margins; transverse sulcus slightly behind middle. Foveolae elongate and shallow, concealed from above. Pronotum short, sellate and compressed in middle; dorsum traversed by three strong sulci, only typical sulcus interrupting median carina, but all three crossing lateral carinae. These consist of interrupted raised callosities, strong and convergent in front of 1st sulcus, obsolescent between 1st and 2nd and strongly divergent and progressively weaker thereafter; metazona much shorter than prozona, its hind angle broadly rounded. Lateral lobes of equal height and length, with a sinuous ascending lower margin and a rounded lower posterior angle. Mesosternal interspace transverse in both sexes. Tegmina and wings with more or less attenuate apices, abridged to half length of abdomen, or less. Hind femur moderately robust, knee lobes rounded; arolia much shorter than claw. External and internal genital structures unspecialized, typical of *Gymnobothrus* genus group.

Discussion.—This new genus has affinities both with *Gymnobothrus* – notably *Gymnobothrus rimulatus* (Karsch) and also with *Guichardippus somalicus* Dirsh. Its rugose integument and reduced arolia testify to a terricolous mode of existence, separating it from members of *Gymnobothrus* with their much larger arolia and graminicole to terri-graminicole habits. It includes two species: *Brachybothrus phyllopterus* sp. n. from SOMALIA and *B. hola* sp. n. from KENYA, which can be diagnosed by means of the key below.

Distribution.—SOMALIA, KENYA.

Key to species in the genus *Brachybothrus*

- 1 Of heavier build, head proportionately larger. Lateral pronotal carinae distinct in metazona in both sexes; prozona/metazona ratio 1.8 in the male, 1.6 in female. Tegmina with elongate, sharply attenuate apices (Figs 297, 302). SOMALIA.....*phyllopterus* sp. n.
- Of more slender build, head proportionately smaller. Lateral carinae in metazona weak in male and obliterated in female. Prozona-metazona ratio 1.5 in male, 1.25 in female. Tegmina narrowed, but not sharply attenuate apically (Fig. 304). KENYA *hola* sp. n.

Species notes

Brachybothrus phyllopterus sp. n.

<http://zoobank.org/A0E83A68-E9C0-450F-9123-9056799B239A>

Figs 297–303

Material.—Holotype male: SOMALIA: 5 km S. of Dinsor, 31.VII.1981, broad-leaf bush and *Acacia* on red sand. All paratypes: 3 males, 1 female, same data as holotype; 5 males, 6 females, 5 km S. of Bardera, 30.VII.1981, thorn scrub and loose stones on silt, Ritchie (NHMUK).

Description.—As in key and generic description. Coloration speckled in shades of fawn, brown and blackish-brown. Dorsally, an ochraceous stripe of varying width runs from fastigium to tip of abdomen. This is flanked by a broader subdorsal, contrasting dark-brown band extending from antennal sockets across postocular area and upper pronotal lobes to anal areas of tegmina, and contrasts with pale-ivory of lower cheeks and large spot in lower part of lateral pronotal lobe. Underside pale fawn. Outer face of

hind femur fawn, upper ferruginous, with two brown transverse bands; hind knee and adjacent basal part of tibia blackish-brown, outlined by pale sub-basal rings; rest of tibia and lower area of femur slate-grey. Coloration of females more uniform in less contrasting shades of ferruginous-brown. Some specimens have large dark spots in metazona and upper face of hind femur.

Measurements.—See Table 10.

Discussion.—As under genus; marked terricole mode of life.

Distribution.—SOMALIA.

Brachybothrus hola sp. n.

<http://zoobank.org/FF360752-C3BD-45D9-8FB4-C291CC5566DE>

Figs 304–309

Material.—Holotype male: KENYA: Hola 01°30'S 40°00'E, 29.XII.1972, coll. ?; allotype female, same data as holotype. All paratypes: 1 male, 1 female, 17 kms N.E. of Mambeala Rock Rd., Nguni-Kora 00°20'S, 38°32'E 1800'. 28.V.1975, Robertson and Robertson (NHMUK).

Description.—Diagnosis as under genus and key to species. Size small. Coloration of similar pattern to *phyllopterus*, but in more vivid, contrasting shades and hues.

Measurements.—See Table 10.

Discussion.—As under genus; marked terricole mode of life.

Distribution.—KENYA.

Generic diagnosis

Guichardippus Dirsh, 1959

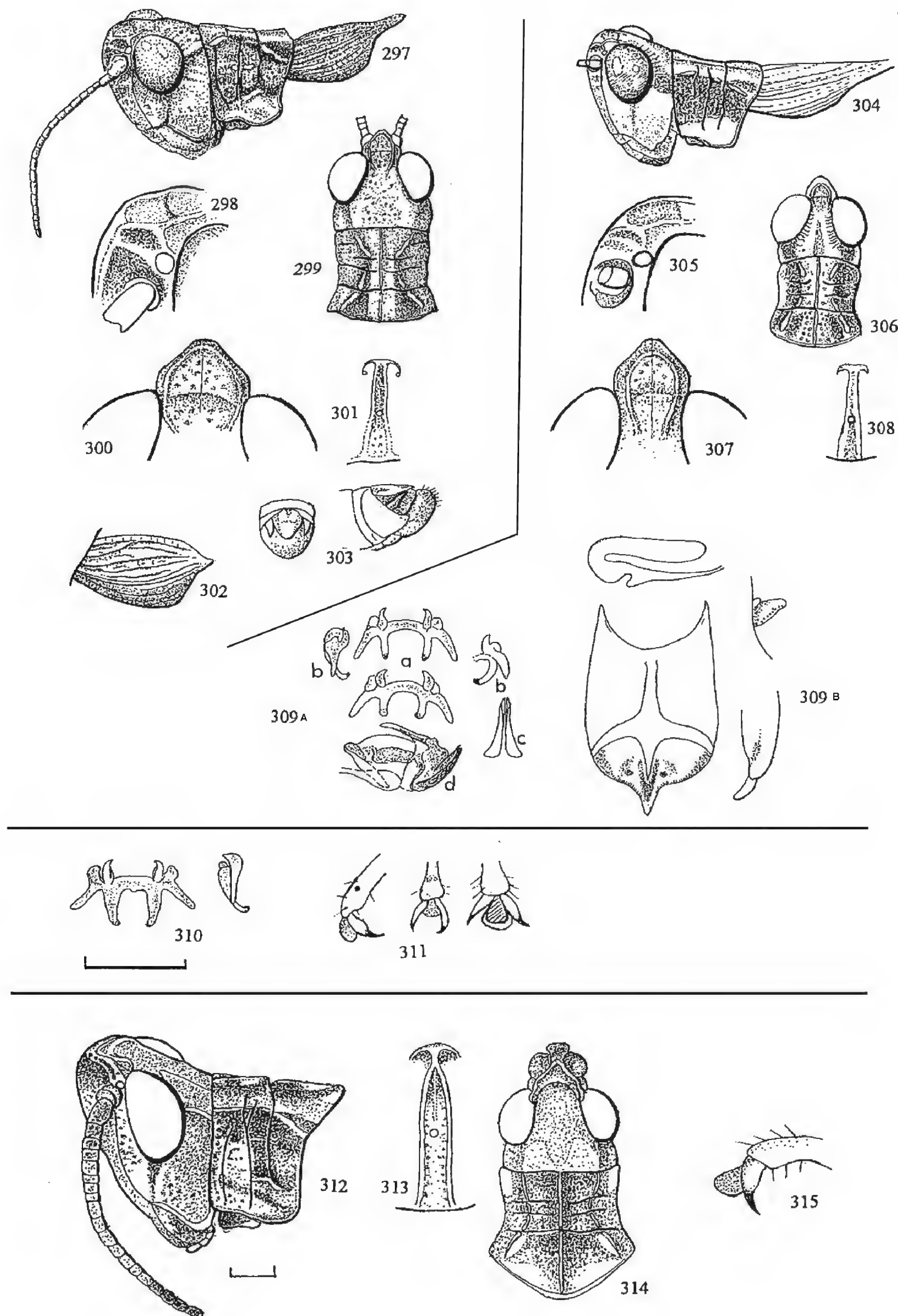
Guichardippus Dirsh, 1959: 37.

Type species.—*Guichardippus somalicus* Dirsh, 1959: 38, fig. 8, by original designation.

Description.—As in the key to genera (p. 67). Structure of antennae and dorsum of pronotum particularly diagnostic. Antennae shorter than head and pronotum in both sexes; in male basally compressed and apically incrassate. Frontal ridge oblique, nar-

Table 10. Measurements of *Brachybothrus* spp.

	<i>phyllopterus</i> (mm)		<i>hola</i> (mm)	
	M	F	M	F
Antennal length	4.5–5.0	4.5–5.0	4.8	4.5–5.0
Antennal width	0.2	0.22	0.22	0.28
Pronotal length	2	3	2.4	3.2
Prozona/metazona ratio	1.7	1.65	1.4	1.35
Tegminal length	3.4	2.7	3.7	2.8
Tegminal width	1.2	1.8	1.5	1.6
Tegminal length/width ratio	2.5	1.8	2.5	1.75
Hind femur length	7.5–8.5	9.5–10.7	8.2	8.9
Hind femur depth	2.2–2.5	2.9–3.3	2.4	3.1
Hind femur length/depth ratio	3.3–3.4	3.2–3.27	3.4	2.9
Total length	10.0–11.2	14.0–16.0	11.5	14.4



Figs 297–315. Tribe Gymnobothrini. Figs 297–303. *Brachybothrus phyllopterus* n. gen. et sp. n., male: 297. Oblique view head, pronotum and tegmen; 298. Oblique view vertex; 299. Dorsal view head and pronotum; 300. Dorsal view vertex; 301. Frontal ridge; 302. Tegmen; 303. Abdominal apex laterally and dorsally. Figs 304–309. *Brachybothrus hola* sp. nov.: 304. Oblique view head, pronotum and tegmen; 305. Oblique view vertex; 306. Dorsal view head and pronotum; 307. Dorsal view vertex; 308. Frontal ridge; 309. Genital structures, A. Male, B. Female elements. Figs 310–311. *Guichardippus somalicus*: 310. Epiphallus; 311. Tarsal claws and pulvillus (lateral view), compared with *B. phyllopterus* (smallest) and *G. rimulatus* (larger, seen dorsally). Figs 312–315. *Malcolmburria angolensis* male: 312. Oblique view head and pronotum; 313. Frontal ridge; 314. Head and pronotum from above; 315. Tarsal claw and pulvillus. Scale lines all 1 mm: that below Fig. 310 applies to Figs 298, 300, 305, 307, 309–311, 315; that below Fig. 312 applies to Figs 297, 299, 301–304, 308, 312–314.

rowly sulcate with raised margins. Fastigium of vertex elongate-parabolic, deeply concave with raised carinulae, transverse sulcus well behind middle; fastigial foveolae crescent-shaped, with rough surface. Pronotum elongate with deep transverse sulci, medial carina sharp, lateral disrupted, converging towards middle in an X pattern, raised in front of first sulcus and behind typical, obliterate in middle; metazona slightly more than half length of prozona its hind margin obtuse-angular, broadly rounded. Genital structures characteristic of genus group. Coloration mottled in cryptic shades of browns and greys without distinctive bright pigmentation.

Discussion.—A distinctive monotypic Somali endemic genus, with *somalicus* Dirsh, 1959 as its unique species.

Species notes

Guichardippus somalicus Dirsh, 1959⁴
Figs 310–311

Guichardippus somalicus Dirsh, 1959: 38, fig. 8.

Material.—SOMALIA: Hargeisa-Borama region and Sheikh (NHMUK).

Description.—As for genus above. Size (in mm): total length males 12–14, females 18–20. Epiphallus as in Fig. 310.

Discussion.—Terri-graminicole, on dry stony hillsides and in gullies with short grass, scattered bushes and aloes, acacias as well as other shrubs and small trees. Frequently found on open ground but never far from shelter of vegetation where it hides on disturbance.

Distribution.—SOMALIA.

Generic diagnosis

Malcolmburria Uvarov, 1953
Malcolmburria Uvarov, 1953: 130.

Type species.—*Malcolmburria angolensis* Uvarov, 1953: 130–132, figs 141–144, by original designation.

Description.—Size below medium; total length: male 13–14 mm, female 18–20 mm. Head acute apically (Fig. 312), ascending above level of pronotum; frontal ridge very narrow apically, evenly widening towards clypeus. Fastigium of vertex (Fig. 313) triangular, concave, with widely arched transverse sulcus, margins raised, overhanging compound eyes; foveolae vertical, broad, their surface coarsely and irregularly pitted. Pronotum saddle-shaped with strongly raised, laminate medial carina (Fig. 314), deeply notched by typical sulcus; lateral carinae narrow, interrupted by all three sulci, excurved and partly obsolescent in metazona. Tegmina narrow with dense venation and weak to obsolescent intercalary vein in medial area. Epiphallus with incurving, apically pointed, digitiform lophi typical of the *Gymnbothrus* genus group. Coloration marbled in cryptic shades of chestnut to light-brown and stramineous with charcoal-black and slate grey maculation, but details of pattern variable. Antennae dark basally and apically, paler in middle or, as in most females, barely darkened apically. Hind fe-

mur slate-grey-brown basally, charcoal-black apically, corresponding part of hind tibia similarly dark. In some specimens outer face of hind femur is stramineous with a faint dark stripe and only the genicular crescent black. Tegmina clear in apical part and with 4–5 evenly spaced large dark spots in basal half. Hind wing with remigium infumate and vannus light yellowish or pinkish.

Discussion.—Monotypic genus originally described from ANGOLA. A distinctive genus superficially resembling the oedipodine genus *Calephorus*, but readily distinguished from it. Fire melanism evident; its color always provides protective crypsis.

Species notes

Malcolmburria angolensis Uvarov, 1953⁵
Figs 312–315

Material.—Holotype male: ANGOLA: Luchase distr., Quangu R., X. Further material: ANGOLA: Moxico dist; Huamba, V; river Luena, Katula, V; river Langiliko, VI. TANZANIA: Sumbawanga (NHMUK).

Description.—As in diagnosis of genus, above.

Discussion.—According to its collector, Dr. M. Burr, the insects have some terricolous tendencies. Their mottled coloration blended closely with the black and grey sand on which they were found.

Distribution.—E. ANGOLA; S.W. TANZANIA.

Generic diagnosis

Tenuihippus Willemse, 1994

Tenuihippus Willemse, 1994: 454–456, figs 31–32, 36, 40–43.

Type species.—*Tenuihippus parvus* Willemse, 1994: 454, by original designation.

Description.—Very small and slender with smooth integument and fully developed wings. Head acutely conical, somewhat ascending and about as long as pronotum. Antenna narrowly ensiform, slightly longer than length of head and pronotum (Fig. 316). Fastigium as in Figs 316, 317; fastigial foveolae absent. Frons strongly oblique, frontal ridge as in Fig. 318. Pronotum weakly tectiform; carinae sharp over entire length (Fig. 316), metazona longer than prozona, posterior margin obtuse-angular. Lateral lobes higher than long, their lower hind angle broadly rounded. Hind femur slender (Fig. 319), surpassing tip of abdomen. Hind tibia slightly shorter than femur; arolium large. Abdominal appendages unspecialized; internal genital structures as in Fig. 322, typical of *Gymnbothrus* genus group, with epiphallic lobes relatively short and bent inwards.

Discussion.—A monotypic genus and a distinctive member of the *Gymnbothrus* genus group. Known only from the male holotype and paratype from the type locality on the banks of the Zambezi in ZAMBIA. Phallic characters clearly indicate that *Tenuihippus* belongs to the *Gymnbothrus* group of genera. Willemse (1994) states that it most closely resembles *Roduniella*, *Coryphosima*, and

⁴ Dirsh 1965: 449, fig. 360 whole insect, male, head and pronotum, antenna, tip of male abdomen, epiphallus.

⁵ Dirsh 1965: 453, fig. 364, whole insect, male, pronotum, apex of head, epiphallus.

Chirista, but differs from them and the other genera principally in its very small size, slender build and elongate metazona of pronotum.

Species notes

Tenuihippus parvus Willemse, 1994

Figs 316–322

Material.—ZAMBIA: Holotype male (W. Prov.) Kasize (E. bank of Zambezi) opposite Sioma, 70 km S. of Senanga, 16.VI.1987, L. Willemse; Paratype female, same data as holotype.

Description.—As for genus: General coloration uniform dull brownish, paler yellowish ventrally. Postocular area and adjacent part of lateral pronotal lobes may be darkened, also narrow triangular area along sides of pronotal disc; proximal half or upper side of hind femur with faint dark fascia.

Measurements.—See Table 11.

Distribution.—ZAMBIA. Collected in a small marshy plot with reeds, adjoining the Zambezi river.

Table 11. Morphometric measurements of *Tenuihippus parvus*.

	M (mm)
Antennal length/length head and pronotum	1.2
Pronotal length	2.0–2.3
Metazona/prozona ratio	1.4
Tegminal length	12.0–12.2
Hind femur length	8.7–9.0
Hind femur length/depth ratio	4.7–4.9
Total length	11.7–12.3

Generic diagnosis

Zacompsa Karsch, 1893

Zacompsa Karsch, 1893: 54, 74.

Type species.—*Zacompsa festa* Karsch, 1893: 74, by original designation.

Description.—Size small to medium (males 15–24, females 22–31 mm); moderately robust. Integument shiny, finely dotted. Antennae filiform, somewhat compressed in basal third. Frons oblique, weakly convex in profile; frontal ridge shallowly sulcate, margins obtuse, partly obliterate and divergent below ocellus. Fastigium more or less concave, trapezoidal to oblong; lateral carinulae distinct, but medial carinula obsolescent; transverse arcuate sulcus weak. Temporal foveolae concealed from above, elongate, shallow and indistinct, sometimes obliterate. Pronotum subcylindrical; medial carina thick and strong, lateral carinae usually weak, especially in metazona and between first and second transverse sulci, while strongest and somewhat convergent in prozona. All three transverse sulci distinct, the third, and sometimes the first, interrupting medial carina. Metazona distinctly shorter than prozona, its hind margin obtuse-angular, or broadly rounded. Mesosternal interspace open. Tegmina and wings fully developed or shortened. Membrane of tegmen parchment-like, reticulation moderately dense, intercalary vein present but weak. Hind femur

of medium build, genicular lobes of equal length, rounded. Arolium large. Male supra-anal plate elongate-cordate, sulcate; cercus narrow, tapering and obtuse apically. Epiphallus with moderately narrow, arcuate bridge, large ancorae, elongate, pointed posterior processes and elongate, finger-shaped lophi (Fig. 24). Spermathecal duct (Figs 327, 329) of usual structure for Gymnbothrini. Ovipositor short with robust valves; lower pair with rounded external lateral projections. Coloration in all taxa bold contrasting pattern of alternating pale and dark stripes on dorsum and sides of body (Fig. 323). Three pale stripes may vary in shade from ivory-white to darker yellowish. One is a broad stripe on dorsum extending from fastigium to tip of tegmina, and other two lie one each on lower half of body, including sides of abdomen; between them are two dark stripes in shades of blackish-brown one each in upper half of body, extending from antennal sockets to tip of tegmina. Hind knee also black, but hind femur is otherwise yellowish-orange. A typical speckled coloration may occasionally occur in some females.

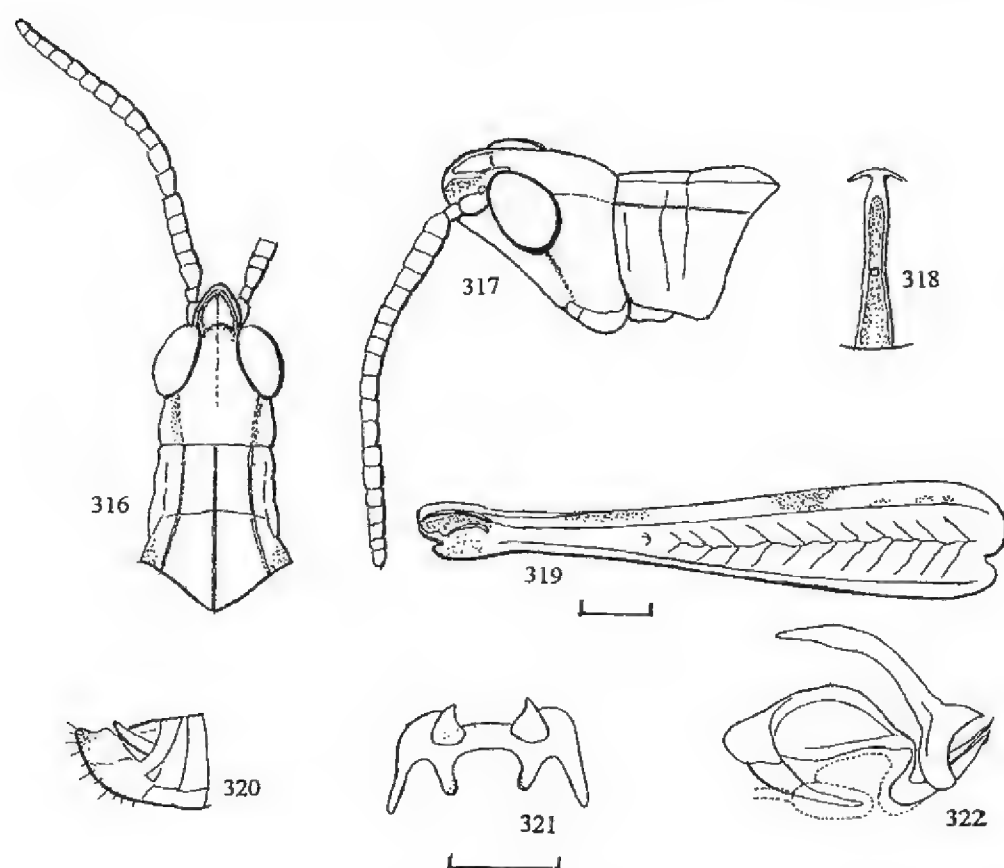
Discussion.—In reviewing the African Gymnbothrini, Uvarov (1953) diagnosed *Zacompsa*, based on *festa*, Karsch, as distinct, on the basis of its non-constricted, almost cylindrical pronotum with typical sulcus placed distinctly behind middle and its peculiar striped patterning. Certain genera, previously attributed by him to *Zacompsa* as synonyms (Uvarov 1926), were reallocated to *Gymnbothroides* Karny, whilst others became synonyms of *Gymnbothrus* I. Bolívar (*Pseudochirista* Karsch, *Ogmothela* I. Bolívar).

Five species have at different times been attributed to *Zacompsa* by different authors:

1. *Z. festa* Karsch, 1893: male, female types, TOGO: Bismarck-burg (MfN).
2. *Z. bivittata* Uvarov, 1926: Holotype female, N. NIGERIA (NHMUK) as *Z. festa* var. *bivittata*, subsequently elevated to species rank *Z. bivittata* by Ramme, 1931: 931.
3. *Z. karschi* Ramme, 1929: Holotype male, CAMEROON: Benue (MfN). Ramme (1931) later changed its status to *Z. bivittata karschi*. Subsequently, Dirsh (1970) rendered it a synonym of *Z. bivittata*.
4. *Z. pedestris* Uvarov, 1953: 132. Holotype male, TANZANIA: Rukwa valley, Ikuu forest (NHMUK).
5. *Z. helonoma* Jago, 1966: 351. Holotype male, GHANA: N. Region (NHMUK).

The present review recognises only two species: the highly localized *Z. pedestris* Uvarov, 1953 (W. Tanzania, Ufipa-Rukwa) and the widespread *festa* Karsch, 1893 (W. Africa to Sudan and Eritrea). Within the latter, three geographically distinct subspecies can be identified: (i) the typical *Z. festa festa* Karsch, 1893 (Guinea savanna zone from Sierra Leone to Nigeria and Cameroon in moist grasslands within thickets (also montane, upland forests and riverine habitats); (ii) *Z. festa bivittata* Uvarov, 1926, Sahelian and Sudanian Zones from Senegal to Ethiopia and Eritrea (rather localized meso-hygrotypic grassland habitats often in association with woodlands and watercourses, but occasionally, e.g. in South Sudan, in open grasslands); (iii) *Z. festa helonoma* (Jago, 1966) which is apparently an intermediate form between (i) and (ii) above; known so far only from northern Ghana.

Editorial note.—No author has at any time doubted the validity or the specific distinctiveness of either *Z. festa* or *Z. pedestris*. The other species (*bivittata*, *karschi*, and *helonoma*) have, however, a more



Figs 316–322. Tribe Gymnobothrini. *Tenuihippus*. **Figs 316–322.** *Tenuihippus parvus* male: 316. Dorsal view head, pronotum and antennae; 317. Idem oblique lateral view showing temporal foveolae; 318. Frontal ridge; 319. Hind femur, outer side; 320. Tip of male abdomen laterally; 321. Epiphallus; 322. Phallic complex without epiphallus from left side. Scale lines all 1 mm: that below Fig. 321 applies to Figs 321, 322; that under Fig. 319 applies to Figs 316–320.

uncertain history (e.g. Ramme 1931, Dirsh 1970). Popov, as seen above, considered their distinctive characters to be insufficient for species status, and so proposed to reduce them all to subspecies of *festa*. Mestre (2001) independently came to the same conclusions but went further. After a study of specimens from all of West Africa, and of the original type specimens, he synonymized all *Zacompsa* species, other than *Z. pedestris*, with *Z. festa*. Accordingly, we follow Mestre (2001) and so omit Popov's key to subspecies and his treatments of them.

Key to species within the genus *Zacompsa*

- 1 Tegmina reduced to small pads barely length of pronotum. TANZANIA: Ufipa-Rukwa area.....*Z. pedestris* Uvarov, 1953
- Tegmina and wings more fully developed, macropterous, or brachypterous, wings half length of abdomen or longer. Coloration darker, brighter and more contrasting; upper face of hind femur often with a distinctive white spot in basal third. Both sexes usually macropterous, folded wings reaching hind knees. Guinea savanna from MAURITANIA and SENEGAL, through SIERRA LEONE and CAMEROON, to SUDAN and ERITREA.....*Z. festa festa* Karsch, 1893

Species notes

Zacompsa festa Karsch, 1893

Figs 323–327

Zacompsa festa Karsch, 1893: 74, fig. 11.

Zacompsa karschi Ramme, 1929 (syn. Dirsh 1970).

Zacompsa helonoma Jago, 1966: 351. (syn. Mestre 2001).

Zacompsa festa var. *bivittata* Uvarov, 1926 (syn. Mestre 2001).

Material.—Lectotype male, *festa*: TOGO: Bismarckburg, 20.IX–31.X.1890, R. Büttner, Zool. Mus. Berlin, no. 5543 (MfN). Paralectotypes – 1 female, same data as lectotype; 1 female, same as lectotype but I.XI–15.XII.1890; 1 male, 1 female, same as lectotype but 20.IX–15.X.1890. Holotype male *helonoma*: GHANA: N. Region, 6 mi. N. Mole R. Bosum-Daboya Road, [09°20'N, 1°30'W], 26.XII.1963. All paratypes – 9 males, 2 females, same data as holotype; 2 males, 2 mi. W. of Daboya, 24.XII.1963, Jago. (all NHMUK). Holotype female *festa* var. *bivittata*: NIGERIA: Azare (NHMUK). Holotype male *karschi*: CAMEROON: Benue (MfN). SENEGAL: Bambey; Ziguinchor, (rizières); Tambacounda (long grass, bush). MAURITANIA: Timbedra; Aioun el Atrouss. MALI: Nr. Darou, Gourma; Kara. NIGER: Agadez (smallest and palest specimens); Niger river valley S. of Niamey, several localities. SIERRA LEONE: Msala (NHMUK). TOGO: Misahohe (NHMUK). GHANA: Volta region, Chiara, Nkwanta, Kpandu; Northern region, Yeji (NHMUK). NIGERIA and CAMEROON: Obokamaji (nr. Ibadan) (NHMUK); Azare (type series of *Z. f. bivittata*), Ba Sidderi (1 male paratype of *Z. f. bivittata karschi* Ramme); Karim; Wurge; Kalkala (at light); Kianje. SUDAN: Singa; Suki; MCPS (Gedaref); Basunda. ETHIOPIA: Meisso (near station); Lake Bishoftu; River Hawash. ERITREA: nr. Ducumbia; Keren.

Description.—Wings are usually about same length in both sexes; when folded, tips of tegmina vary from falling short of the tip of the abdomen to more or less level with, or even surpassing, the hind knees. Coloration variable; bright and contrasting in some, with face and medial stripe on occiput dark and pale spots on upper face of hind femur. In others, paler, particularly on the face and with uniformly pale rusty-brown upper and outer face of hind femur, without notable maculation.

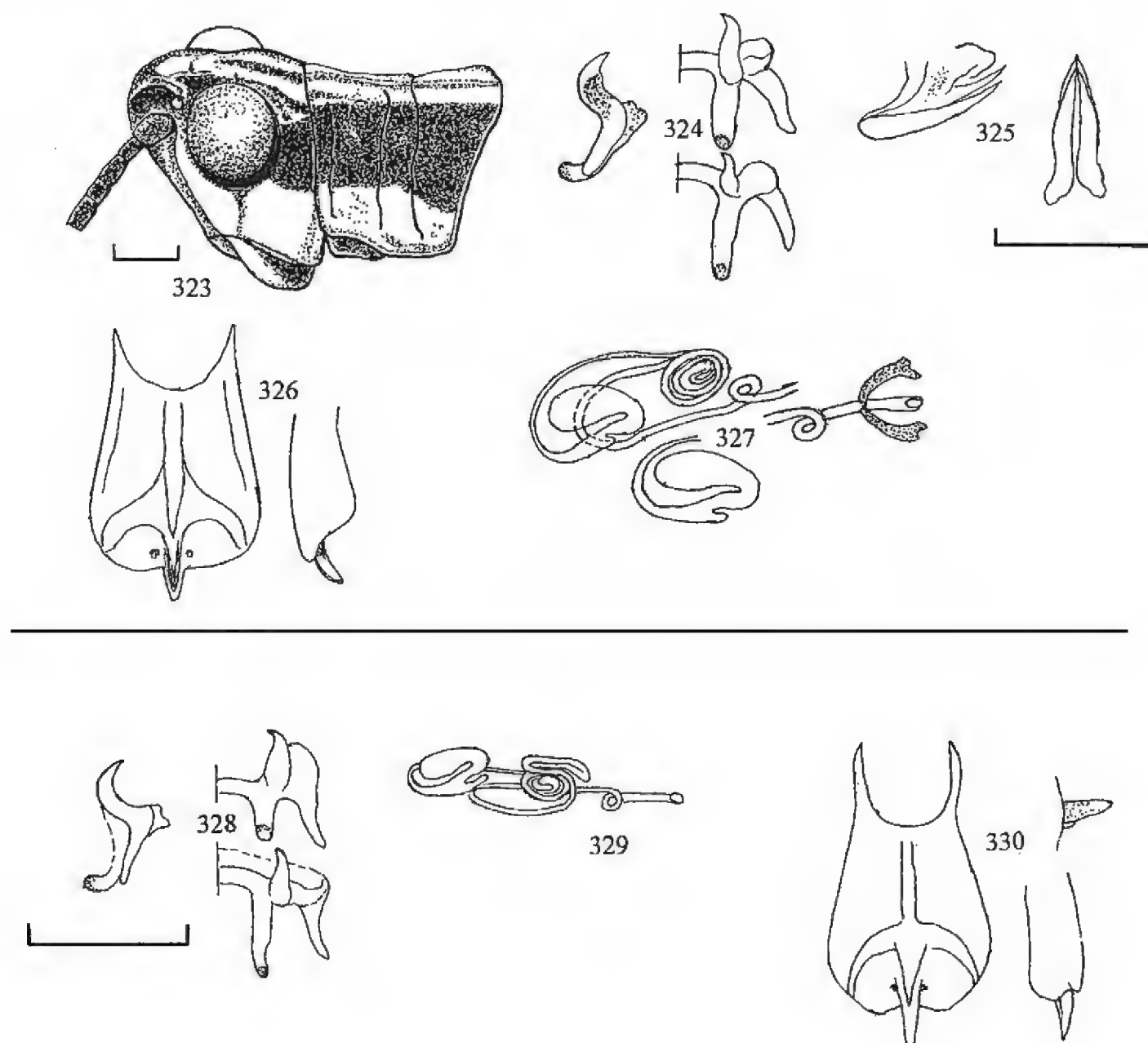
Measurements.—Table 12. This table shows the considerable variation in size over the range of the species *festa* as now understood

Distribution.—MAURITANIA, SENEGAL, SIERRA LEONE, IVORY COAST, GHANA, MALI, BURKINA FASO, BENIN, TOGO, NIGER, NIGERIA, CAMEROON, CHAD, SUDAN, ETHIOPIA, ERITREA. Not so far recorded from Uganda, Tanzania or Kenya.

Discussion.—The species shows a remarkable stability of characters throughout its considerable range. It is likely, as Jago (1966) comments, that this stability of characters is an expression of the general similarity of environmental conditions in habitats across the Guinean zone. The only significant variation is associated with latitude, whereby coloration of populations in the Sahel/Sudanian zones (SENEGAL to SUDAN and ERITREA), is often duller and less contrasting; white spot in basal third of hind femur indistinct or absent; length of wings variable, even in same locality.

Table 12. Measurements of *Zacompsa festa*.

	<i>Zacompsa festa</i> (mm)	
	M	F
Antennal length	11.5–13.0	9.0–11.0
Pronotal length	3.0–4.0	4.1–5.0
Tegminal length	14.0–16.0	17.5–18.5
Hind femur length	12.7–13.2	14.0–15.8
Hind femur length	15.0–20.5	22.0–26.5



Figs 323–330. Tribe Gymnbothrini. *Zacompsa* spp. Figs 323–327. *Z. festa festa*: 323. Head and pronotum obliquely; 324. Epiphallus dorsally and laterally; 325. Apical valves of aedeagus; 326. Female subgenital plate from above and side; 327. Spermathecal duct and spermatheca. Figs 328–330. *Zacompsa pedestris*: 328. Epiphallus from above and left side; 329. Female spermathecal duct; 330. Female sub-genital plate from above and right side and left female cercus. All scales represent 1 mm; that under Fig. 325 applies to Figs 324, 325, 328; that under Fig. 323 applies to Figs 323, 326, 327, 330, 329, and 330.

Zacompsa pedestris Uvarov, 1953

Figs 328–330

Zacompsa pedestris Uvarov, 1953: 132.

Material.—Holotype male, *pedestris*: TANZANIA: Rukwa valley, Ikuu forest, 1.IV.1950 (NHMUK); Paratype female, Muze, 26.IV.1950, Bredo. 5 males, Rukwa Rift, 5.II.1962; 1 female, Ufipa, Ilemba gap, 12.III.1959, Vesey-Fitzgerald (NHMUK).

Description.—Differs from *Z. festa* Karsch in the following respects: shorter and more obtuse fastigium; broader meso- and metasternal interspaces; relatively minor differences of genital structures (Figs 328, 329); abbreviated tegmina reduced to short, leathery apically pointed pads, which just meet dorsally, and just reach middle of abdomen; in *festa* wings overlap and extend beyond mid-line of abdomen; details of coloration similar to *festa*, but even darker and more contrasting; pale femoral spots of *festa*, however, are lacking. Two color forms in local populations in both sexes: in one pale dorsal stripe is widened, as in *festa*, and contains a dark but even more contrasting elongate spot on occiput; in the other, dorsal stripe is much narrower and has no dark spot. However, there are no structural differences to warrant taxonomic recognition.

Distribution.—S.W. TANZANIA.

2.3 The tribe Pargaini and its genera

Description.—Defined in the diagnosis of tribes and genus groups (p. 67).

Discussion.—Dirsh (1975) erected the subfamily Pargainae, (type genus *Parga* Walker, 1870), which he placed in the family Catantopidae. He included in the subfamily the following genera: *Ac-teana* Karsch, 1896, *Amphicremna* Karsch, 1896, *Machaeridia* Stål, 1873, *Paraparga* I. Bolívar, 1909, *Pargaella* I. Bolívar, 1909, and the Madagascan genus *Pseudopargaella* Descamps & Wintrebert, 1966. According to Dirsh (*loc. cit.*) the main difference of the Pargainae from other Acridoidea is a very characteristic structure of epiphallus, which is bridge-shaped, the bridge is narrow, ancorae absent or short, rudimentary, not articulated; lophi short, mostly bilobate, lateral plates well developed (cf. Figs 31–34). However, Jago (1983b) questioned Dirsh's treatment and reduced Pargainae to the status of a genus group within Acridinae. He also argued, correctly, that on the basis of its genital structures, the genus *Odon-tomelus* I. Bolívar, 1890 should also be included in the group, but then added eight other genera allied to *Gymnbothrus* I. Bolívar, 1889 (originally placed by Dirsh (1975) in his subfamily Gymnbothrinae), regardless of the fact that in these the structure of the epiphallus is quite different—the ancorae are well-developed and articulated with the bridge, while the lophi are finger-shaped,

elongate and never bilobate (Figs 24–30). Subsequently, Jago (1994), in his revision of genus *Odontomelus* I. Bolívar, 1890, reiterated his 1983 arrangement, while synonymizing the genera *Amphicremna*, *Paraparga*, and *Pargaella* under *Odontomelus*.

Here, *Gymnbothrus* and its allies are treated as a separate tribe Gymnbothrini. Consequently, the *Parga* group becomes the tribe Pargaini and contains the following genera recorded in East Africa: *Acteana* Karsch, 1896, *Parga* Walker, 1870, *Machaeridia* Stål, 1873, *Odontomelus* I. Bolívar, 1890, and *Phryganomelus* Jago, 1983.

Key to the genera in the tribe Pargaini

- 1 Small and robust; micropterous; antennae clearly divided into basal broad and flat, medial narrow and flat, and apical cylindrical tapering parts (Fig. 339). TANZANIA: coastal areas..... *Acteana* Karsch, 1896
- Small to medium, elongate and slender; micropterous, short, or fully winged. Antennae not modified as above, except in *Parga*, which is fully winged 2
- 2 Both upper lobes of hind knee strongly elongate (Figs 351, 352). Integument with deep longitudinal ridges. Fully winged. Antennae short and broad and modified as described under couplet 1, their outer margin serrate (Figs 341–350). Widespread *Parga* Walker, 1870
- Knee lobes only moderately or weakly elongate, integument smooth or only moderately sculptured. Antennae unmodified, usually somewhat ensiform 3
- 3 Integument very smooth, without marked sculpturing, pronotal disc very narrow with sharply defined parallel lateral carinae. Fully winged, but never with a pre-anal speculum in hind-wing. Widespread *Machaeridia* Stål, 1873
- Integument more or less sculptured and coriaceous, fully winged or more or less micropterous. When fully winged, often but not always with a hind-wing pre-anal speculum in males and/or females 4
- 4 Of larger size, coarsely sculptured, micropterous. West to East Africa, forest *Phryganomelus* Jago, 1983
- Of smaller size; most species micropterous, but some brachypterous or fully winged, with or without a speculum. Sub-Saharan Africa.....
..... *Odontomelus* I. Bolívar, 1890

Generic diagnosis

Acteana Karsch, 1896

Acteana Karsch, 1896: 255.

Type species.—*Acteana alazonica* Karsch, 1896: 255, by original designation.

Description.—Phallic structures in *Acteana* are typical for the *Parga* genus group; structure of epiphallus with its vestigial ancorae and elongate, bilobate lophi (Figs 31, 340) is particularly diagnostic. For details see under species, below.

Discussion.—Genus monotypic.

Species notes

Acteana alazonica Karsch, 1896

Figs 67, 331–340

Acteana alazonica Karsch, 1896: 255, fig. 7.

Material.—Holotype female, Zanzibar (MfN): TANZANIA: 5 males, 3 females, Dar es Salaam, III.1936, K. H. Key (NHMUK); 3 males, 1 female, University College Campus, 8 ml. W. Dar es Salaam, 4.IV.1967; 1 female, Pugu hills SW of Dar es Salaam airport, 500', 28.IV.1982; 1 male, 1 female, Korogwe-Msata Rd., 103 km. N. of Msata, summit of Kopje, 27.IX.1982; 1 male, 1 female, Korogwe-Handeri Rd., 24 km. N.E. of Sindeni, 3.X.1982, riverine grassland, degraded woodland, all Jago (NHMUK).

Description.—Male antennae slightly longer and, in female, slightly shorter, than combined length of head and pronotum together; flagellum divided into basal, medial and apical parts, (basal moderately widened, flattened and serrated, particularly in female; medial slightly widened and compressed; apical cylindrical and somewhat inflated distally in male). Head short, conical; frons oblique and weakly concave in profile; frontal ridge shallowly sulcate with raised lateral margins, parallel above, divergent below ocellus. Fastigium of vertex widely parabolic, about as long as wide, with weak, but distinct median and lateral carinulae and a shallow arcuate sulcus behind middle. Dorsum of pronotum narrow; medial carina thick and somewhat raised, lateral carinae inflexed and weaker, particularly in metazona. Only typical sulcus distinct; metazona half length of prozona, its hind margin obtuse-angularly incurved. Mesosternal interspace quadrate in male, weakly transverse in female; metasternal interspace narrow in male, broadly open in female (Figs 67A, B). Tegmina lobiform, lateral, narrowly elongate, only a fifth as wide as long, barely covering tympanum, the latter fully developed. Male supra-anal plate triangular, with obtusely rounded apex and without a marked medial sulcus. Cerci small, obtusely conical; subgenital plate simple, short, subconical with obtuse apex. Phallic complex similar in structure to that in *Parga* genus group: epiphallus with moderately narrow, arcuate bridge with a marked medial projection, without ancorae, and with moderately elongate posterior projections. Lophi directed inwards, and divided into an elongate, finger-like outer, and a shorter, abruptly rounded, inner lobe. Penis valves slender, upturned. Integument finely and uniformly pitted, structure of head and pronotum as in Figs 331, 333. Antenna as in Fig. 339 and genital structures as in Figs 31 and 340. Generally dark-testaceous to rusty brown, often, but not always and more usually in males, paler dorsally; sometimes, more often in females, there is some fine, dark speckling. Cryptic coloring, probably associated with substrate homochromy, covers most of body, including underside, antennae, and legs. Sometimes with a striking large, ivory-white, flat, smooth callosity on lower half of lateral pronotal lobe, and bright, rusty-red coloration of lower outer sulcus of hind femur. In some specimens underside is also suffused with rusty-red which could be associated with sexual maturation.

Discussion.—Note that the shape of the lateral pronotal lobe differs from that in *Anacteana* species, and the tegmina are much narrower.

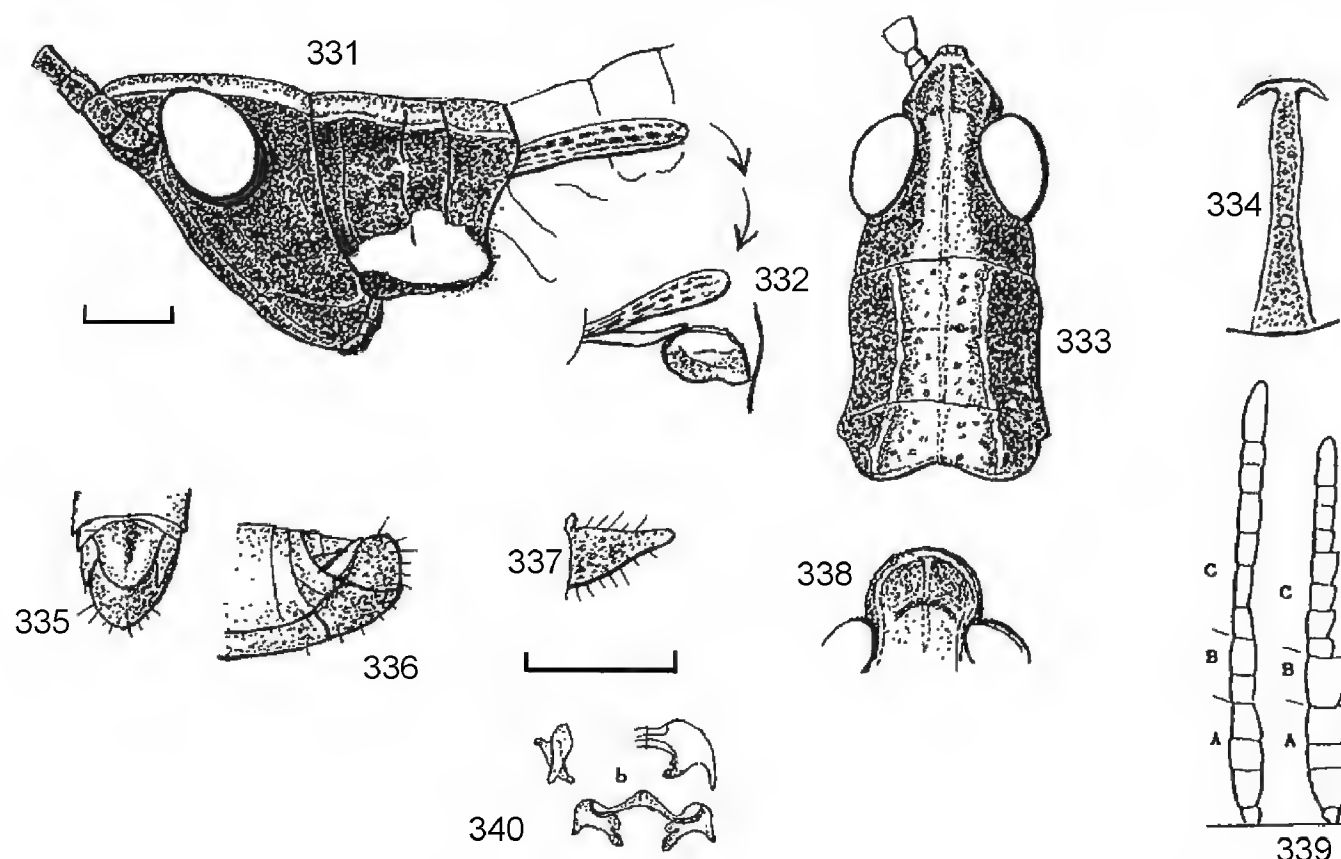
Distribution.—TANZANIA: Zanzibar (holotype only); coastal and close hinterland areas of TANZANIA (S.W. of Dar es Salaam to the KENYA border).

Generic diagnosis

Parga Walker, 1870

Parga Walker, 1870: 504 (replacement for *Amycus* Stål, 1855: 353).

Type species.—*Amycus xanthopterus* Stål, 1855: 353.



Figs 331–340. Tribe Pargaini. *Acteana*. Figs 331–340. *Acteana alazonica* male: See also Fig. 67: 331. Lateral view head, pronotum, and tegmen; 332. Tegmen raised to show tympanum and wing; 333. Head and pronotum from above; 334. Frontal ridge; 335. Abdominal apex from above; 336. Abdominal apex from side; 337. Left cercus; 338. Female, apex of head from above; 339. Male, female antennae; 340. Epiphallus from dorsal and lateral angles. Scale lines represent 1 mm: that next to Fig. 340 applies to Fig. 340 and 337; that below Fig. 331 applies to all the rest.

Description.—Of medium size, slender and elongate. Integument strongly carinate and rugose. Antenna short and broad, clearly divided into basal, medial and apical part, with acutely serrated outer edge (Figs 341–350). Head elongate and acutely conical, strongly carinate above. Fastigium elongate, parabolic, foveolae absent. Pronotum with well developed median and parallel lateral carinae; metazona shorter than prozona, its hind margin obtuse-angular. Tegmina and wings fully developed with acute apices and dense, rough venation and reticulation and numerous intercalary veins. Hind femur narrow; upper lobes of hind knee elongate, lower lobes acute (Figs 351, 352). Apex of male abdomen (Fig. 353) elongated, acute. Internal genital structures in male (Figs 354–356).

Discussion.—The genus *Parga* is in need of revision. Three species are known from eastern Africa: *P. xanthoptera* (Stål, 1855), *P. taeniata* (I. Bolívar, 1889), and *P. musanae* Sjöstedt, 1931 with the possibility that a fourth, *P. cyanoptera* Uvarov, 1926 (recorded from South Sudan and southern Africa), could also occur there. A tentative key to species is given below.

Key to East African species in the genus *Parga*

- 1 Upper internal lobe of hind knee only slightly longer than outer lobe (Fig. 351). Antenna broad and only slightly longer than head (Figs 346–349) *xanthoptera* (Stål, 1855)
- Upper internal lobe of hind knee considerably longer than outer lobe (Fig. 352). Antenna proportionately longer than head (Figs 341–345)..... 2
- 2 Outer side of male antennal flagellum moderately serrated, frons in profile incurved; head no longer than pronotum *musanae* Sjöstedt, 1931
- Outer side of male antennal flagellum strongly serrated. Frons in profile straight, or weakly incurved, head distinctly longer than pronotum..... *taeniata* (I. Bolívar, 1889)

Note: *P. cyanoptera* Uvarov is similar to *P. xanthoptera* but differs in having proportionately longer and narrower antennae (Fig. 350).

Species notes

No taxonomic changes to the treatment by Dirsh (1970) are proposed, so redefinition of the East African species is not attempted here.

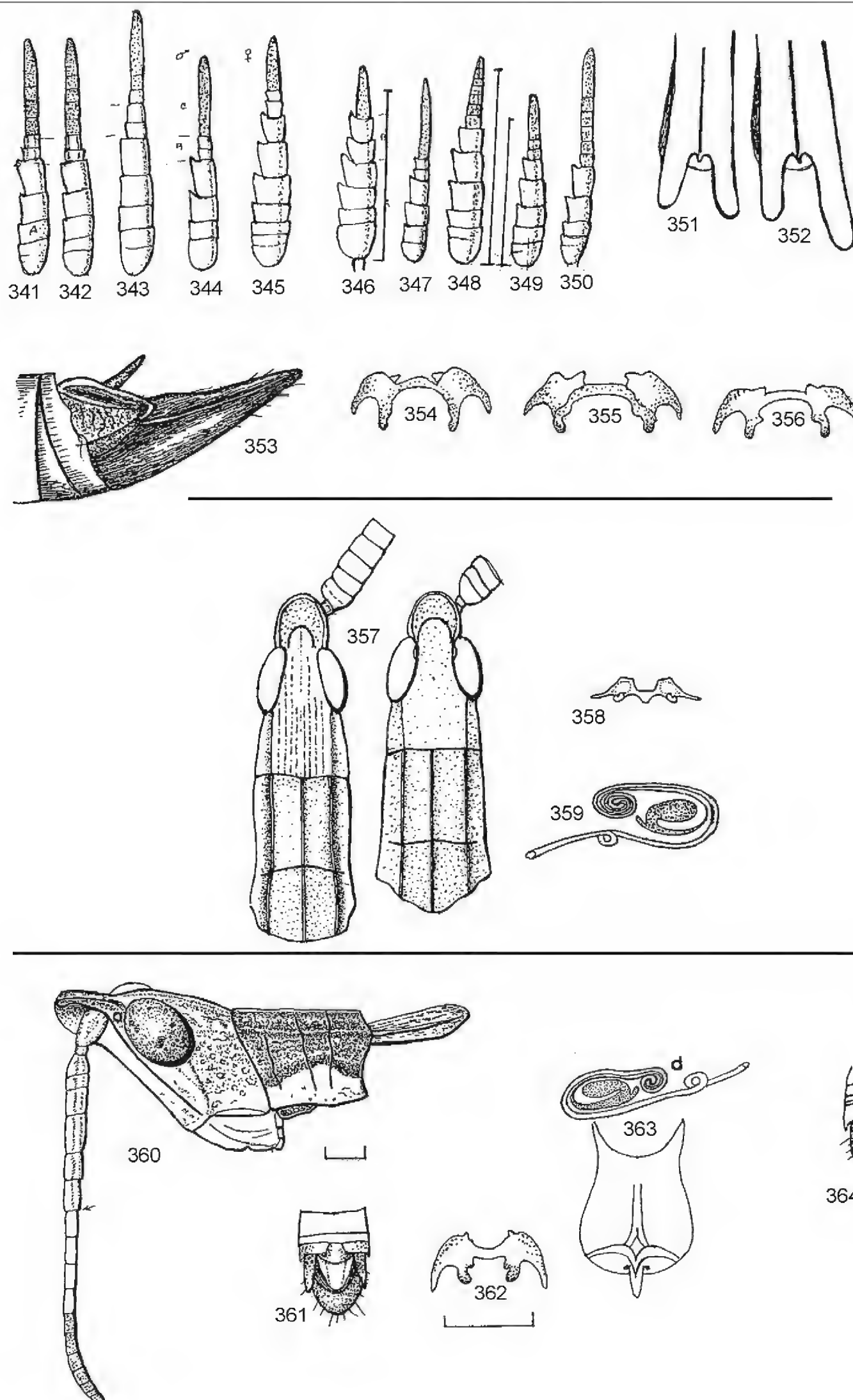
Generic diagnosis

Machaeridia Stål, 1873

Machaeridia Stål, 1873: 90, 100.

Type species.—*Machaeridia bilineata* Stål, 1873: 100, 216, by original designation.

Description.—As in key to genera, above (p. 99). A genus closely related to *Parga* with genitalia of fairly similar structure. Slightly more elongate; integument finely rugose and dotted, not ridged. Antenna broadly ensiform, serrated segments along external edge unspecialized, evenly tapering apically; as long as, or slightly longer than, head and pronotum. Fastigium parabolic, as long as, or slightly longer than broad (Fig. 357). Temporal foveolae absent. Dorsum of pronotum narrow, its surface smooth, weakly tectiform to almost flat; carinae sharp, well developed; lateral carinae straight parallel. Metazona shorter than prozona, its hind margin obtuse-angular, almost rounded. Tegmina and wings fully developed, venation and reticulation dense, intercalary vein of medial area present. Hind wings without a preanal speculum. Hind femur narrow, upper knee lobes much shorter than in *Parga*, their apices acute. Male subgenital plate acute, of similar structure, but shorter than in *Parga*. Genital structures (Figs 358, 359) similar to those in *Parga*.



Figs 341–364. Tribe Pargaini: morphology. **Figs 341–356.** *Parga* spp.: 341–350. Antennae: 341–343. *P. musanae*: 341. Male (Uganda, Soroti); 342. Male (Tanzania, Mkomasi); 343. Female, same; 344, 345. *P. taeniata*: 344. Male (Tanzania, Old Shinyanga); 345. Female (Tanzania, Kisulu); 346–349. *P. xanthoptera*: 346. Female, (Tanzania, 8ml. S. of Chala mission); 347. Male (Tanzania, Ufipa); 348. Female, (Uganda, Tororo); 349. Female, (Tanzania, S. of Chala mission); (line alongside 348 and 349 indicates length of head and pronotum); 350. *P. cyanoptera*, male. **Figs 351, 352.** Posterior femoral knee lobes from dorsal view (left leg): 351. *P. xanthoptera*; 352. *P. musanae*; 353. *P. xanthoptera*, apex of abdomen. **Figs 354–356.** Male epiphalli: 354. *P. xanthoptera*; 355. *P. musanae*; 356. *P. taeniata*. **Figs 357–359.** *Machaeridia bilineata*: 357. Male head and pronotum, dorsal view left, compared with *Machaeridia conspersa* right; 358. Epiphallus (from Hollis 1966); 359. Female spermathecal duct. **Figs 360–364.** *Phryganomelus* spp. *Ph. phalangidus*: 360. Head, pronotum, antennae and tegmen in profile; 361. Abdominal apex from above; 362. Epiphallus. *Ph. romi*: 363. Female spermatheca and dorsal aspect of subgenital plate. *Ph. auriventer*: 364. Male abdominal apex from above. All scale lines represent 1 mm: Scale line under Fig. 360 applies also to Figs 341–353, 357, 359–361, 362, 364; that under Fig. 362 also applies to Figs 354–356, 358.

Discussion.—*Machaeridia* Stål contains two species, *M. bilineata* Stål, 1873 and *M. conspersa* I. Bolívar, 1889. Both are common throughout eastern Africa.

Key to species in the genus *Machaeridia*

- 1 Of more slender build. Fastigium of vertex longer than wide. Tegmen narrow, more than 9 times as long as wide; wing relatively narrow, colorless or basally bluish. Hind femur narrow, its length/depth ratio about 8 *bilineata* Stål, 1873
- Of more robust build. Fastigium of vertex as long as wide. Tegmen wider, length/width ratio about 7.5; wing proportionately broader, colorless, or yellowish at base. Hind femur broader, length/depth ratio about 6.5 *conspersa* I. Bolívar, 1889

Species notes

No taxonomic changes are proposed, so redefinition of the East African species is not attempted here.

Generic diagnosis

Odontomelus I. Bolívar, 1890

Odontomelus I. Bolívar, 1890: 309.

Type species.—*Opomala brachyptera* Gerstaecker, 1869: 216, by monotypy.

Amphicremna Karsch, 1896: 250. Type species: *Amphicremna scalata* Karsch, 1896, by monotypy (syn. Jago 1994).

Paraparga I. Bolívar, 1909: 286. Type species: *Machaeridia strigosa* I. Bolívar, 1889 by monotypy (syn. Jago 1994).

Pargaella I. Bolívar, 1909: 287. Type species: *Pargaella luctuosa* I. Bolívar, 1909, by monotypy (syn. Jago 1994).

Description.—Differentiated as in key to genera, above.

Discussion.—Full revision published by Jago (1994). The genus now contains four winged species, two brachypterous species and 28 flightless micropterous species, including the recently described *O. ancestrus* Hugel, 2014 from Mauritius.

Species notes

As no taxonomic changes are proposed, redefinition of the East African species is not attempted here.

Generic diagnosis

Phryganomelus Jago, 1983

Phryganomelus Jago (1983a): 151–159.

Type species.—*Odontomelus fullonius* Karsch, 1896: 215, by subsequent designation Jago (1983a).

Description.—See Jago (1983a).

Discussion.—Very closely related to *Odontomelus* I. Bolívar, from which it differs in larger size, coarser integument, some details of coloration, but particularly in marked elongation of the head, with

frons concave in profile, as also rather weak lateral pronotal carinae (Fig. 360). Currently five species, all micropterous, are attributed to this genus: *P. fullonius* (Karsch, 1896) from D.R. CONGO (synonymized with *olivescens* Sjöstedt, 1923 by Ramme (1929)), *P. biafrensis* (I. Bolívar, 1905) from EQUATORIAL GUINEA and CAMEROON; *P. romi* (I. Bolívar, 1908a) from D.R. CONGO and ANGOLA; *P. phalangidus* Jago, 1983 from UGANDA and E. D.R. CONGO; and *P. auriventer* Jago, 1983 from UGANDA.

Species notes

Only the last two species mentioned above have a known East African distribution and are discussed below.

Phryganomelus phalangidus Jago, 1983

Figs 360–362

Phryganomelus phalangidus Jago, 1983a: 157.

Material.—N.E. D.R. CONGO: Bas-Uélé, valley of the Semliki river. UGANDA: Budongo Forest, Bugoma Forest, Mabira Forest, Mpanga Forest (ml. 21 Kampala-Masaka road), and Bwamba Forest, L. Albert (Butiaba), and Kigezi.

Description.—Of medium size for genus. Male: Antennae longer than combined length of head and pronotum; flattened basal part shorter than rounded apical part (Fig. 360). Head more elongate than pronotum, apex very prominent (Fig. 360). Tegminal apices not surpassing back edge of abdominal tergite 1. Tip of abdomen as in Fig. 361; epiphallus as in Fig. 362. Coloration distinctive, underside of thorax and base of abdomen orange-red. Fore and mid-legs light red-brown. Hind femora orange-red below, shading to dark-brown apically; outer and dorsal areas brown. Hind tibiae dark-brown, black near knee. Female: spermathecal duct as in Fig. 363 (*P. romi*). Vertex and tegmina structurally similar to male. Underside of body orange-red. Hind femora shortest in genus and distinctly more stocky than in *P. auriventer*.

Discussion.—Its range of distribution broadly overlaps with *Odontomelus kwidschwianus* to which it bears a slight superficial resemblance. While both species occur in the same forests (from Bas Uélé in N.E. D.R. CONGO, the valley of the Semliki river and forests from the western rift of UGANDA east to the Nile (fig. 15 in Jago (1983a): Budongo, Bugoma, Mpanga, and Bwamba Forest Reserves), *P. phalangidus* favors the sunlit forest floor and litter along forest paths, while *O. kwidschwianus* inhabits the leaves and stems of forest grasses above ground level.

Distribution.—N.E. D.R. CONGO; W. and C. UGANDA.

Phryganomelus auriventer Jago, 1983

Fig. 364

Phryganomelus auriventer Jago, 1983a: 155.

Material.—Holotype male: UGANDA: Mabira forest, nr. Jinja, 33°00'E 00°25'N, 28.IV.67, and paratypes.

Description.—Closely resembles *P. phalangidus* Jago, 1983, but differs from it as follows: slightly larger size (in mm: total length males 23–28, females 32–36), and more massive hind femora; fore and mid-legs olive green; hind femora light brown above, outer areas olive green, lower surfaces yellow to pale green; underside

of thorax and proximal sternites of abdomen yellow to pale green, not orange. Detailed structure of apex of male abdomen differs between the two species (compare Figs 364 and 361).

Distribution.—UGANDA: In forests west of the Nile outlet from Lake Victoria, but always much rarer than *P. phalangidus*.

2.4 Transitional genera of uncertain position

Genus group diagnosis

The *Aiolopus-Uganda* genus group and *Dorsthippus*

Description.—Outlined in Diagnosis of Tribes and Genus Groups, above, Page 39. Defined on basis of male and female genitalia.

Discussion.—This assemblage contains a group of four genera – *Aiolopus*, *Jasomenia*, *Paracinema*, *Uganda* – and *Dorsthippus*. Their peculiarity lies in that they fit the definitions of neither of the two subfamilies Oedipodinae or Acridinae. The Oedipodinae are considered to be characterized by their femoral/tegmenal sound-producing mechanism, the sound being produced by the rubbing of a sharp carinula on the inner side of the hind femur against a prominent serrated inter-calary vein, usually in the medial area of tegmina; the Acridinae lack this mechanism, or it is vestigial and said to be incapable of sound-production. Generally, there is little ambiguity in attributing a given genus to one or other of these two subfamilies on the basis of the above distinction. The four genera listed possess a well-developed intercalary vein but in some it lacks the necessary serrations for sound production. Also, their rather slender build and hygrotypic habitat associations are more characteristic of the Acridinae than the Oedipodinae. They are thus at the root of the controversy surrounding the separate identity of the two subfamilies.

Importantly, Slifer (1939) described the presence of a loop at the proximal end of the female spermathecal duct in Acridinae, but which is absent in Oedipodinae. All the four genera considered here lack the proximal loop, and should, therefore, be placed in the Oedipodinae rather than Acridinae. Absence of serrations on the intercalary vein may thus be attributable to secondary loss.

Editorial note.—As discussed in the Introduction (p. 42) we consider these four genera to be most usefully classified as Oedipodinae, rather than Acridinae, and omit further treatment of them here. *Dorsthippus* is also discussed on p. 42.

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